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CONTRACTING ORGANIZATION: Children's Research Institute
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14. ABSTRACT **The focus of our BRAIN training program over the past year of the project is to successfully convert the clinical teaching seminars into a web-based format and internally field tested six modules. To date, the survey data from the in-person lectures and online assessment scores demonstrate that both in-classroom and web-based approaches to teaching topics within the BRAIN program has significant training benefits for healthcare providers across multiple specialties and subspecialties. Our goal in year five was to implement and conduct learning effectiveness experiments with applicable military medical residency programs (see Table 4) using the 28 modules created to date.**

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INTRODUCTION

This report documents the activities conducted between September 2016 – September 2017 for the "Advanced Pediatric Brain Imaging Research and Training program" project. The principal goal of this grant is to advance the training of military clinician scientists in the field of investigative brain imaging technologies to understand the causes of brain injury and the mechanisms underlying brain plasticity following injury. The main goal of this project is to train military medical providers in conducting clinical research using advanced brain imaging technologies to study the causes and consequences of pediatric brain injury. Over the past year, we have continued to update our web-based portal site located at www.MilitaryMedED.com that users can search, upload, and house online training and education-related information. Our Subject Matter Experts "SME" have continued to expand our online BRAIN courseware, which has been made available DoD and civilian trainees.

BODY

The focus of our BRAIN training program over the past year of the project is to successfully convert the clinical teaching seminars into a web-based format and internally field tested six modules. To date, the survey data from the in-person lectures and online assessment scores demonstrate that both in-classroom and web-based approaches to teaching topics within the BRAIN program has significant training benefits for healthcare providers across multiple specialties and subspecialties. Our goal in year five was to implement and conduct learning effectiveness experiments with applicable military medical residency programs (see Table 4) using the 28 modules created to date.

Statement of work-progress to date:

Specific Aim 1: To advance the understanding of the fundamental principles and clinical application of sophisticated MRI techniques that is revolutionizing clinical research into the causes, consequences and care of pediatric brain injury.

Over the past year, the PI together with Ben Scalise (instructional designer/multimedia developer) and Jeff Sestokas (instructional designer) worked closely with the SME to continue developing e-learning courseware on the fundamental principles and applications of advanced MRI techniques. We have successfully conducted field tests at Children's National Medical Center main campus. To date, there have been 129 total field testers (29 trainees within the last 12 months) across all evaluated courses with an average of 3.81 years of experience in neonatology, neurology, critical care medicine, radiology, biomedical engineering, nursing, psychiatry and psychology participated.
A detailed update on our progress on the e-learning module development is summarized in section: E-Module Training Design/Development

Specific Aim 2: To enhance through didactic and clinical teaching the basic science and clinical understanding of the causes, mechanisms, and consequences of pediatric brain injury.

We have effectively expanded our e-learning module portfolio by creating additional curriculum on pediatric brain injury that capture a wide scope of themes in pediatric brain injury including: Resting State Functional MRI, Advanced Image Processing where users learn about the broad principles of image acquisition as well as numerical image processing techniques, Cerebral Metabolic Rate of 02 using MRI, CMRO2 as an important parameter for the brain

function and activities and advanced MR Spectroscopy. Our progress in transitioning these seminars to web-based e-learning modules is detailed in section: E-Module Training Design/Development.

Specific Aim 3: To provide training in clinical research methodology through courses and seminars in biostatistics and research design, and responsible conduct of clinical investigation.

For our e-learning BRAIN modules we have updated our on-line <u>FACTS</u> (Focus on Clinical and Translational Science) curriculum with extensive resources (*archived lectures, tutorials, publications*) covering central research thematic areas including study design, developing goals and objectives, research implementation, statistical analyses, sources of error, etc.

a. E-ModuleTraining Design/Development

<u>A continuous design phase (Training Modules #16-28)</u>

During this year's design phase, we:

- Expanded our e-learning curriculum by creating 10 new (28 total) SCORM-compliant online training modules on the fundamentals of MRI and fetal development. SMEs converted their Power Point presentations by storyboarding (Appendix D) their content for instructional technologists and multimedia developers to begin producing interactive learning objects and assessments.
- Implemented internal workshops to teach SMEs and Co-PIs how to design, develop, and implement online BRAIN courseware training modules #16-28 (see Table 2).
- Performed field testing of the learning management system and 6 online BRAIN seminar courses. Conducted field tests at Children's National Medical Center main campus. There were 129 total field testers (29 trainees in last 12 months) across all evaluated courses with an average of 3.81 years of experience in neurology, radiology, computer science and neuroimaging. The average rating for how beneficial the web-based instructional content was to their learning showed a combined average of 3.582 on a scale of 5 (1=No improvement to 5=Exceptional improvement). Trainees' scores improved 62.4% from their pre to post assessment scores (combined pretest AVG =*59.58%* to combined post test AVG=*96.78%*). The scores demonstrate that online multimedia learning provides a highly engaging educational method to teaching complicated topics about the developing pediatric brain and MRI techniques

- As with the first 15 training modules, we used the same five-stage design approach that incorporates learning objectives, learner abilities, instructional methods, module content, and assessment method into the training delivery (Table 1).

Table 1*. The Five-Stage Design Approach* into the online BRAIN curriculum

Design Requirements	Description
1. Scaffold Knowledge with Learning Objectives	Organize knowledge and skill components for each instructional module scene in a sequence from basic to complex units of learning.
2. Learner's Abilities	Account for the learner's prior knowledge and skill development.
3. Instructional Methods	Establish the approach for presenting the lesson content.
4. Module Content	Focuses on the pediatric brain and MRI fundamental concepts and ideas that a medical provider would need to know.
5. Assessment Methods	Provide knowledge checks before, during or after user engagement with the lesson content. Assessment methods include true and false, multiple choice, multiple response, fill in the blank, drag and drop, and essay.

New Training Module Overview

Modules 19-21 provide an overview and understanding of what Resting State Functional MRI and it's application to the fetal and newborn brain Discussed in the application are the properties of resting state networks, ways to analyze resting state data, and how resting state functional connectivity-MRI (rs-fcMRI) is applied in fetal & neonatal imaging, challenges, opportunities and clinical applications.

Modules 22-23 introduce image processing where users learn about the broad principles of image acquisition as well as numerical image processing techniques. We also present applications for Medical image processing, discussing the basics of image quality assessment and the applications used to acquire data.

Modules 24-26 explain how to measure Cerebral Metabolic Rate of 02 using MRI, CMRO2 as an important parameter for the brain function and activities, understanding the Fick principle, using magnetic resonance imaging to quantify blood oxygenation. Other topics include the basic method of measuring T2 of blood and method for measuring blood flow, learning the pros and cons of alternative methods for quantifying blood oxygenation and blood flow as well as alternative methods for CMRO2 measurements.

Finally, modules 27 and 28 discuss advanced MR Spectroscopy. Whereas in our Introduction to Spectroscopy course we discussed the basics on how to interpret NMR Spectra from Electron Shielding to Sample Chemical Composition and Research Directions in NMR Spectra, here we learn more advanced concepts such as Point-Resolved Spectroscopy and understanding how to quantify metabolites.

Table 2. *Online Training Modules for the BRAIN program (Appendix A)*

Module Title	Learning Objectives
PEDIATRIC BRAIN DEVELOPMENT	
Module #19: Resting State fMRI in Fetuses & Newnborns I (Dr. Josepheen Cruz) **Module #20 : Resting State fMRI in Fetuses & Newnborns II** (Dr. Josepheen Cruz) **Module #21 : Resting State fMRI in Fetuses & Newnborns III** (Dr. Josepheen Cruz)	• Understand what resting state functional MRI is • Know the properties of resting state networks • Learn ways to analyze resting state data • Learn how resting state functional connectivity-MRI (rs-fcMRI) is applied in fetal & neonatal imaging
Module #22: Introduction to Image Processing (Dr. Sonia Dahdouh) **Module #23: Applications to Medical Imaging Application** (Dr. Sonia Dahdouh)	• Learn Broad Principles of image acquisition • Understand & Define Numerical Image • Know the Basics of Image Quality Assessment • Understanding Applications of Image Processing for Medical Image Analysis
Module #24: Measuring Cerebral Metabolic Rate of O2 using MRI I Application (Dr. Feng Xu) **Module #25: Measuring Cerebral Metabolic Rate of O2 using MRI II Application** (Dr. Feng Xu) **Module #26: Measuring Cerebral Metabolic Rate of O2 using MRI III Application** (Dr. Feng Xu)	• CMRO2 as an important parameter for the brain function/activities. • Understand classic Fick principle for measuring CMRO2 • Understand the mechanism of using magnetic resonance imaging to quantify blood oxygenation • Understand basic method of measuring T2 of blood • Understand basic method of measuring blood flow • Discussion for pros and cons of alternative methods for quantifying blood oxygenation and blood flow • Discussion for pros and cons of alternative methods for CMRO2 measurement
Module #27: Advanced MR Spectroscopy Application (Dr. Subechhya Pradhan)	• Reintroduce MR Spectroscopy Basics • Learn Point-Resolved Spectroscopy • Learn about quantifying metabolites

Module #28: Advanced MR Spectroscopy Application (Dr. Subechhya Pradhan)	
Module #29: Pre-Clinical TORTOISE Training Application (Dr. Beth Hutchinson)	• Import raw DWI images from the native format to the TORTOISE format • Correct for motion, eddy-current and geometric distortions using diffprep for a DWI data set • Correct geometric distortions using DRBUDDI for a DWI data set that has been acquired with blip-up, blip-down • Fit the diffusion tensor from corrected DWI images using diffcalc
Module #30: Role of Advanced Quantitative MRI I Application (Dr. Catherine Limperopoulos) **Module #31: Role of Advanced Quantitative MRI II Application** (Dr. Catherine Limperopoulos)	• Understand emerging role of advanced fetal MRI • Learn the impact of quantitative MRI on brain development and injury in the healthy and high-risk fetus • Understand role of advanced fetal MRI techniques

Novel Visual Enhancements

As described in last year's annual report, we continue to create, improve upon and implement multimedia objects (E.g. graphics, audio, animations) throughout application scenes to assist learners in the visualization of new knowledge and concepts. For example, in module 19 scene 8, a multimedia object containing layered graphical element illustrates Resting and Activate States using the BOLD signal. As the SME narrates the scene, the multimedia object illustrates Basic State, Onset of Neural Activity and Activated State (Figure 1). The animations were created not just to convey instructional points, but also to promote active engagement and immerse learners by conveying the phases to understand neuronal activity and increase in cerebral blood flow with a subsequent rise in oxygenated hemoglobin levels. The text elements, interactive and composite still graphics were used to accommodate the visual learner while the audio narration supports the auditory learner.

Figure1. Novel Animation Example

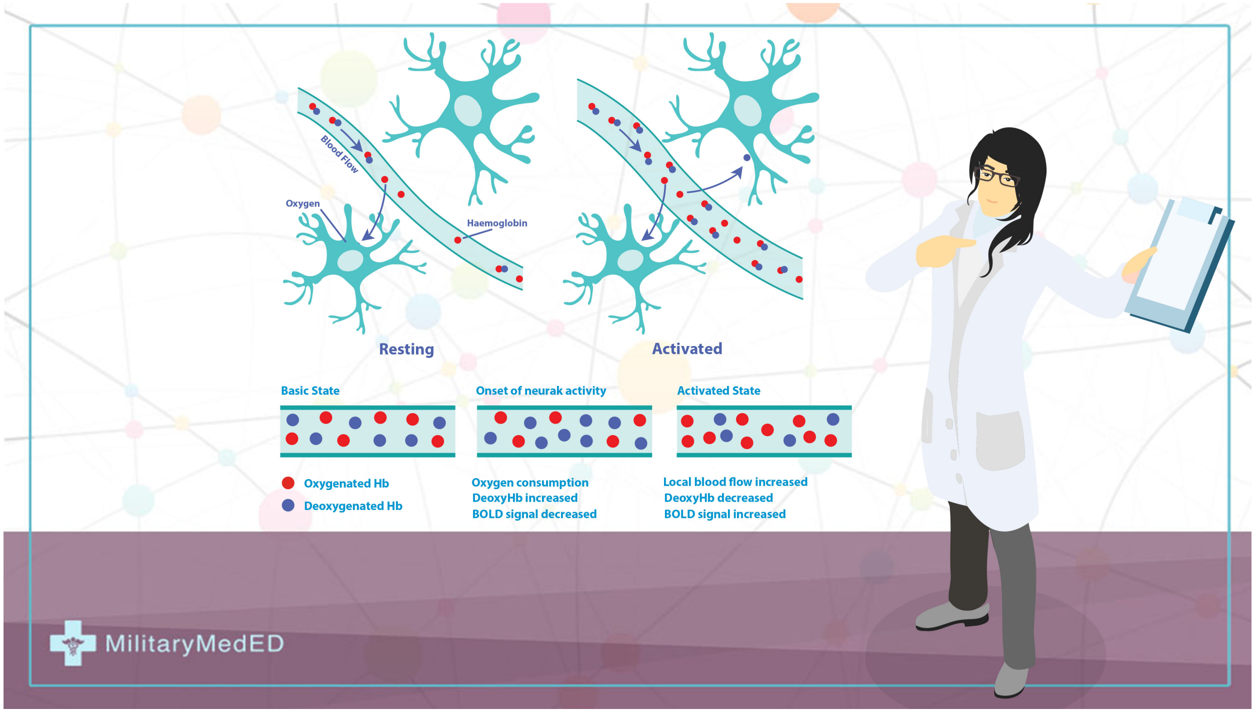
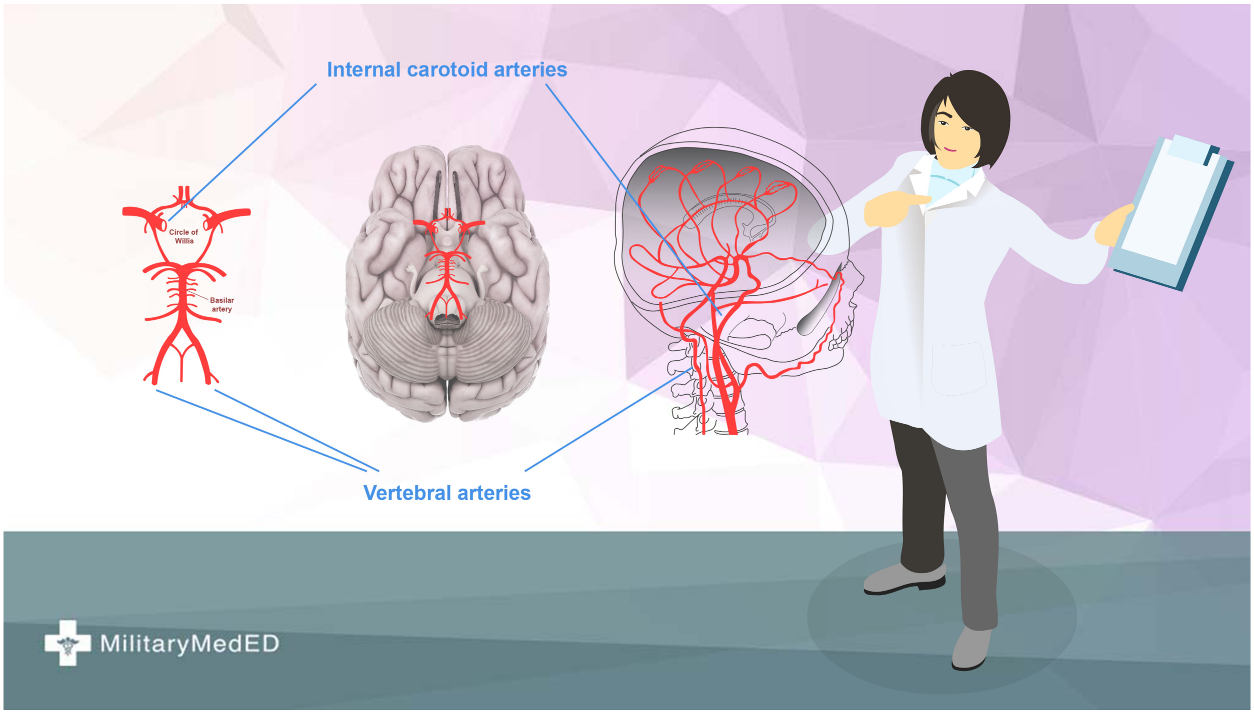


Figure 2. Novel Animation Example



Training Module Player Requirements

As in the case of training modules 1-15, the visual elements presented in modules 19-28 use a variety of graphical elements such as:

- A slide title shown at the beginning of the module
- Multiple levels of bulleted text.
- Still composite graphics
- Custom animations such as animated diagrams or illustrations with text or image fade-ins
- The training modules are BEST viewed using the latest Adobe Flash plugin, which provides a screen visibility of the animated content. For operational purposes, the screens were designed to have a resolution of 1280 x 1024 and 1024 x 768.

B. Knowledge Assessments

Pre and post assessment were developed and implemented for the pilot training modules 1-6 (Appendix B). In addition to the pre and post assessment data, we gathered participant feedback using a post-run module questionnaire accessible from inside the training portal. The post-run module questionnaire depicts information pertaining to perceived improvement of the module learning objectives, usability, organization and challenging/engaging nature of the instructional content as well as open-ended responses on what they liked and didn't like about the module, and recommendations for future module development.

Internal Field Testing: Test Pre and Post Assessment Summary

We continue to actively field test our online training modules. The field tests were facilitated by Ben Scalise. There were 129 total field testers (29 trainees in last 12 months) across all evaluated courses with an average of 3.81 years of experience in neurology, radiology, computer science and neuroimaging. The average rating for how beneficial the web-based instructional content was to their learning showed a combined average of 3.582 on a scale of 5 (1=No improvement to 5=Exceptional improvement). Trainees' scores improved 62.4% from their pre to post assessment scores (combined pretest AVG =*59.58*% to combined post test AVG=*96.78*%). In 2016, the Pretest Mean result was 6.3 and Posttest mean result was 9.8 (63% and 98% respectively). This represents a 12.31% increase in evaluation improvement from year 2016 to 2017.

This field test(s) included a (pre/post: pre-test vs. post-test) mixed design, with training being a between-subjects factor. We randomly assigned participants to the training condition of different brain seminar topics:

Group A	Group B
• **Investigating Brain Plasticity and Connectivity with Structural MRI Techniques** Overall Average | **Pre-Test** 54.5 **Post Test** 100.0 • **Intro to MRI** Overall Average | **Pre-Test** 85.3 **Post Test** 100.0 • **Normal/Abnormal Development of the Cerebellum** Overall Average | **Pre-Test** 33.3 **Post Test** 95.5	• **Fundamentals of Digital Imaging** Overall Average | **Pre-Test** 71.1 **Post Test** 97.7 • **Pediatric MRI Without Sedation** Overall Average | **Pre-Test** 70.0 **Post Test** 87.5 • **Corpus Callosum and other Major Commissures** Overall Average | **Pre-Test** 43.3 **Post Test** 100.0

Summary of Questionnaire Results

Participants were asked to rate their progress on three to five tailored learning objectives intended for the training module content using a one-to-five Likert scale to measure their improvement on BRAIN seminar topics (1 = no improvement, 5 = exceptional improvement). Learning objectives included the ability of participants to understand key concepts of the brain and MRI, define function and terminology, reflect and discuss critical ideas presented throughout the module. Overall, participants felt they made slightly above average progress on understanding the intended learning objectives (combined mean = 3.582, SD = 0.217).

Participants indicated they felt strongly that the training modules presented relevant content that could be applied to real-world medical situations (combined mean=3.75, SD = 0.225), taught information about the pediatric brain and MRI that they previously didn't know (combined mean=3.466, SD=0.524), provided a better understanding about the topics or ideas discussed in the module (combined mean=3.65, SD=0.314), felt that they will apply the learned techniques at their institution (combined mean= 3.583, SD=0.147), and finally will participate in the future using other BRAIN training modules and the learning management platform (combined mean=3.6, SD=0.167).

C. BRAIN e-module Military Implementation Plan-Next Steps

We have begun disseminating the BRAIN courseware to pediatric medical military residency programs as a tool for providing distance learning and training on advanced neuroimaging technologies to study and understanding pediatric brain injury and recovery following injury. We have showcased our BRAIN courseware to key military educational stakeholders to demonstrate the value of this educational tool as a modality for saving time and training costs, improving clinical performance, and providing quality training experiences. We will also create user guides that illustrate best practices and new features of the tool.

D. Future Activities

- In year 6's interim report, we will document the learning effectiveness experiments results and begin enhancing the existing training content and developing additional training modules based on data results in year 7.
- We will document the work and conclusions from the year 6 tasking in the annual report. The report will contain an analysis of the field test events and training effectiveness evaluations, as well as a report on the current status of any issues and suggestions arising from the field test events. The report will also contain our draft Year 7 work plan for feedback prior to final submission. We will prepare a document that summarizes our results and the key points of the report including the background, objectives, research methods, results, and benefits.

For the next 12 months, we plan to complete the following:

- Begin to draft rough timeline with milestones and deliverables and begin development for our new partnership with the National Capital Consortium Pediatrics. We are now partnering with the National Capital Consortium Pediatrics at Walter Reed under the support of Shannon Brockman, MD, the Executive Coordinator of Governance, Section on Pediatric Trainees, to develop a unique eLearning curriculum for their pediatric trainees within the MilitaryMedEd Platform. The team at Walter Reed has identified a need to deliver their training online through simulation courses due to lack of patients within their NICU. After reviewing our eLearning platform and overall progress throughout the last few years, the various courses within, as well as our success rate with post assessment scores gathered from our many test cohorts, they believe that we will be the appropriate channel to develop and produce their eLearning material. We have received a detailed outline for how the team would like to proceed. We are now working on developing the timeline and architecture to meet those deliverables.

- Complete the remaining storyboards that need to be converted from in-classroom lectures to e-learning modules.

- We will continue to conduct field tests at Children's National Medical Center and targeted military medical facilities based on their expertise in pediatrics and/or neurology, radiology, traumatic brain injury and medical education activities.

- We will document, analyze and write initial military field test results using the Krikpatrick training effectiveness evaluations we've been using to date.

- We will continue to enhance the existing training content and develop additional training modules based on data results.

Main Highlights (Appendix C)

- Filter by Learning Plan by Custom Template
    - By clicking on "show more...", you can have more options to filter learning plans by scales values.

    There are two options for using scales values filter

    - Filtering learning plans by scale values from competencies rated at course level

    - Filtering learning plans by scales values from competencies rated in the plan (Final rating)

- Created Filter by Application User
    - When filtering by scales values, the number of rating in the student list will be displayed:
    - We can choose a particular student by typing their name in the user picker field in order to retrieve their learning plans

- Revamped Learning Plan Layout
    - The details of each learning plan is now divided into three intuitive sections

- Learning Plan Competency Information Dashboard

  This dashboard displays the following information

    - The plan's status and the number of competencies that are rated proficient on the total number of competencies of the plan
    - The number competencies that are rated not proficient
    - The number of competencies that are not rated

- Developed Final Rating and Statistics Interface

  Total number of rating

    - It displays the number of courses linked to the competency and wherein the user is enrolled, Clicking on the number will trigger a popup containing the list of courses linked to the competency and if the course was rated or not.

- New Learning Plan Monitoring System
    - This page gives the users the ability to keep track of their learning plans with all the details mentioned above. To access this page, instructors can visit the user profile page and click on “Monitoring of learning plans” in the reports block.

KEY RESEARCH ACCOMPLISHMENTS

Development and implementation of the web-based BRAIN curriculum

- Enhanced and maintained the web-based learning management system that houses the BRAIN online courseware at www.MilitaryMedEd.com

- The site can now be accessed from any device, web browser and operating system

- Developed a total of 28 SCORM-compliant online training modules

- Updated our FACTS (Focus on Clinical and Translational Science) curriculum onto our portal site

- Held ongoing internal and external workshops to teach co-investigators and SMEs how to design, develop, and implement online BRAIN courseware training modules

- Performed field -esting of the learning management system and online seminar courses, which lead to further improvements on the BRAIN courseware modules.

In Addition to the visual enhancements of MilitaryMedED.com, we have implemented a vast range of new UI/UX improvements (front end and back end).

REPORTABLE OUTCOMES

We have trained 129 residents/fellows, of which over 50% came from the National Capital Consortium.

Limperopoulos, C, Sestokas, J.M. (2016) Introduction to military.medED.com, Walter Reed National Military Medical Center. Bethesda, MD.

Limperopoulos, C. (2017) Implementing Military.medED.com: What are the next steps. Walter Reed National Military Medical Center. Bethesda, MD>

We introduced our Brain E-Courseware locally (Walter Reed) and at nationally scientific conferences. We have patterned with Walter Reed National Military Medical Center to develop additional e-learning courseware for Newborn Medicine.

CONCLUSION

We have developed 28 BRAIN eLearning modules and refined our online learning management system. Our initial internal field-testing results on 129 military and civilian trainees demonstrated the effectiveness and responsiveness of our novel eLearning
instructional BRAIN courses.

We have enhanced and maintained the web-based learning management system that houses the BRAIN online courseware at www.MilitaryMedEd.com. The site can now be accessed from ay device, web browser and operating system. We have refined our online FACTS (Focus on Clinical and Translational Science) curriculum onto our portal site and held ongoing internal workshops to teach co-investigators and SMEs how to design, develop, and implement online BRAIN courseware training modules

Our field-testing of the learning management system and online seminar courses has lead to further improvements on the BRAIN courseware applications and in addition to the visual enhancements of MilitaryMedED.com, we have implemented a vast range of new UI/UX improvements (frontend and backend)

We are now partnered with the National Capital Consortium Pediatrics at Walter Reed under the support of Shannon Brockman, MD, the Executive Coordinator of Governance, Section on Pediatric Trainees, to develop a unique eLearning curriculum for their pediatric trainees within the MilitaryMedEd Platform. They identified a need to deliver their training online through simulation courses due to lack of patients within the NICU at Walter Reed. After reviewing our eLearning platform and overall progress throughout the last few years, the various courses within, as well as our success rate with post assessment scores gathered from our many test cohorts, they believe that we will be the appropriate channel to develop and produce their eLearning material. We have received a detailed outline for how they would like to proceed and we are now working on developing the timeline and architecture to meet those deliverables.

APPENDICES

Appendix A

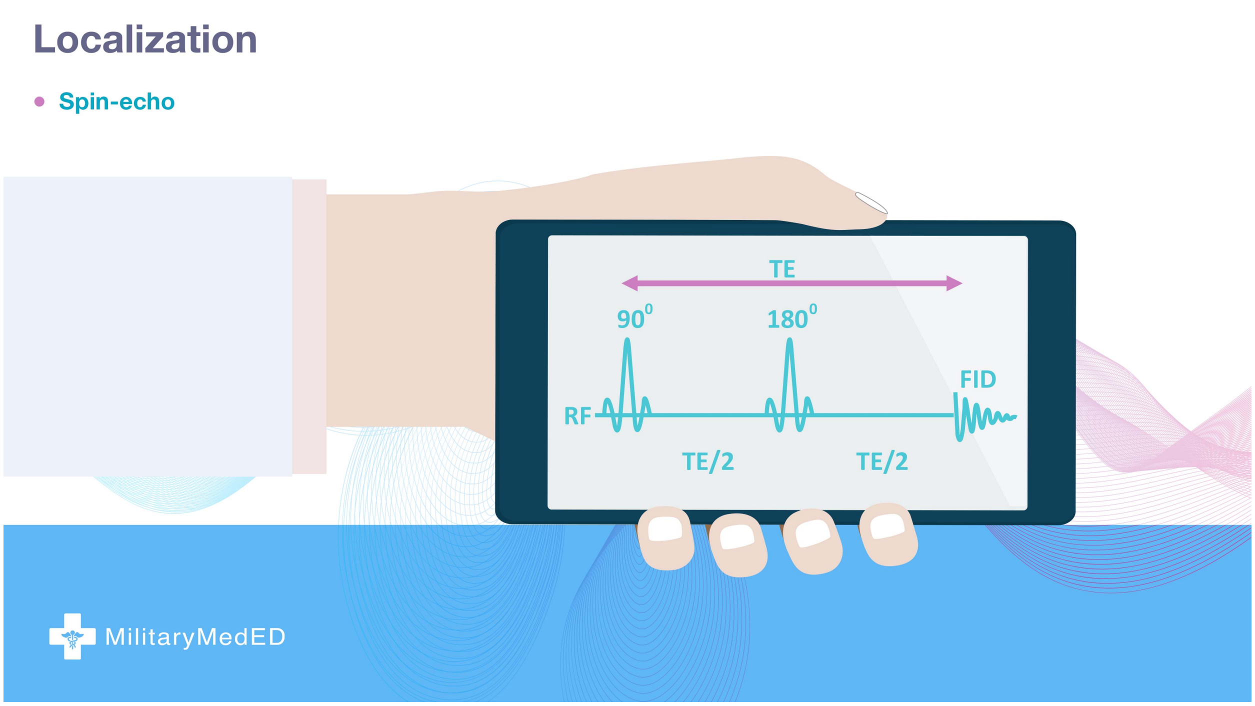
Appendix B

Appendix C

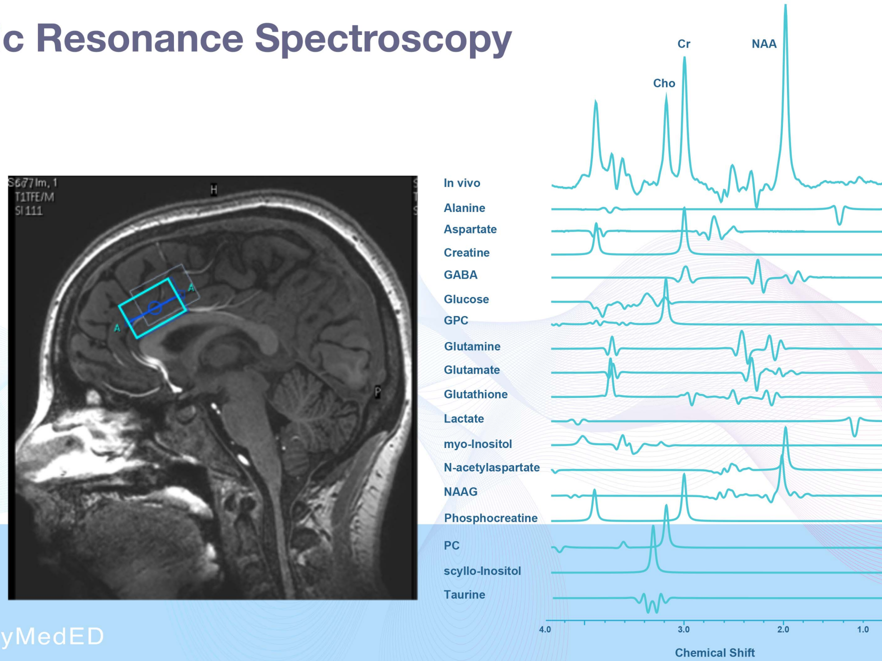
Appendix D

APPENDIX A
NEW E-LEARNING APP DEVELOPMENT

Samples of newly developed eLearning applications



Magnetic Resonance Spectroscopy



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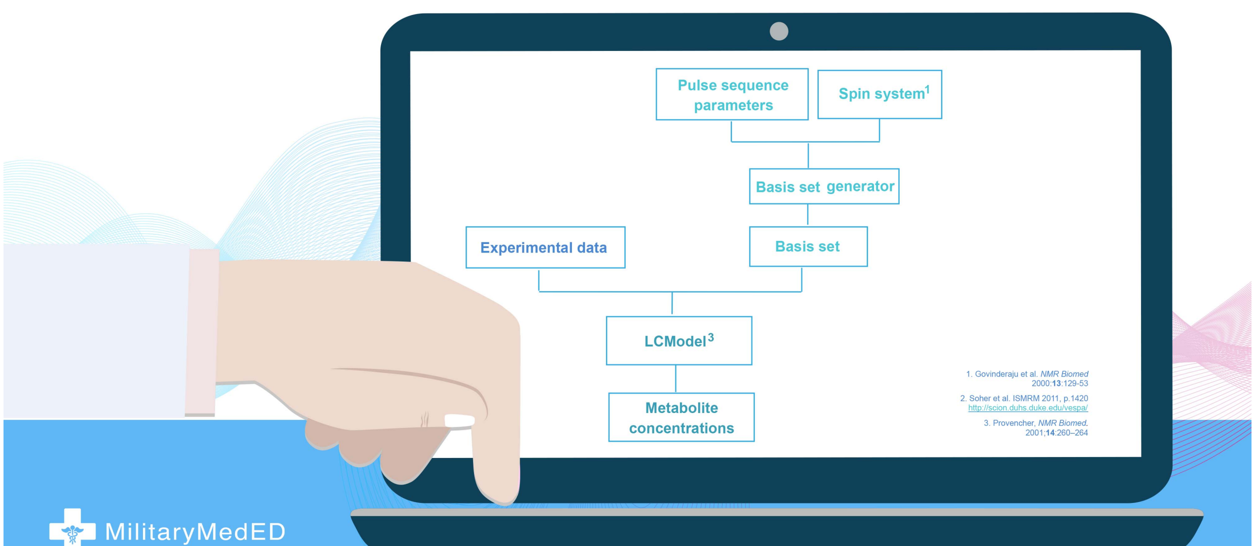
How to analyze the spectra?



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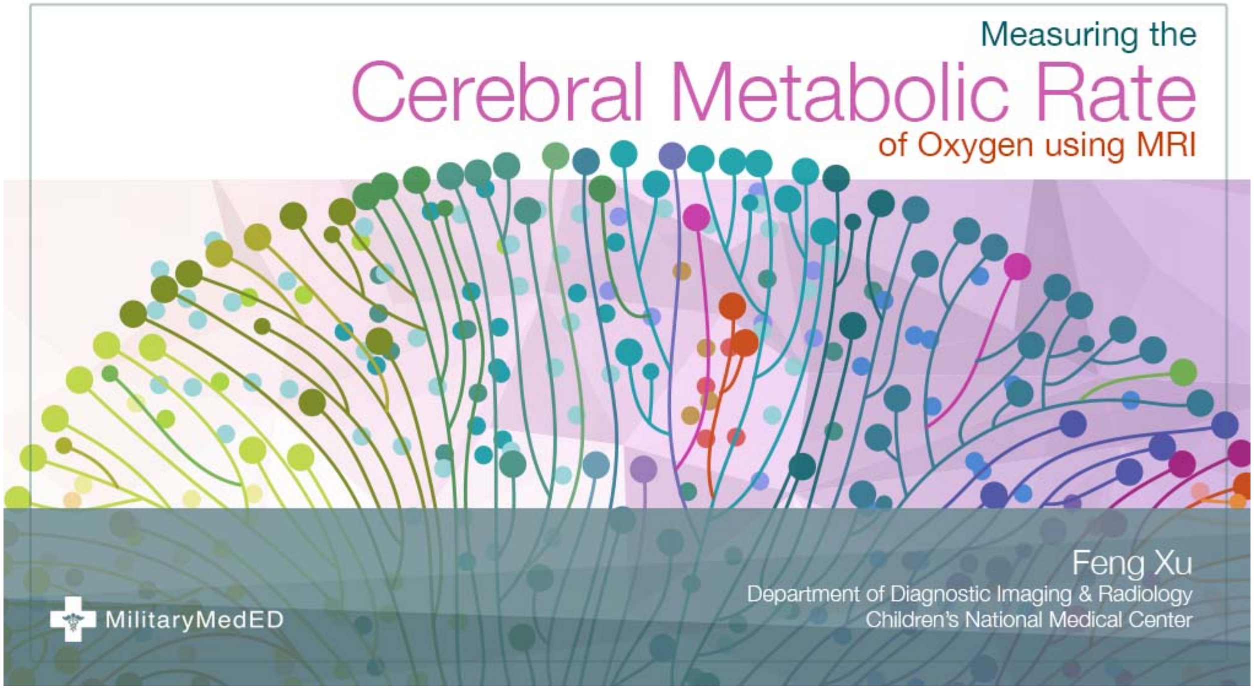
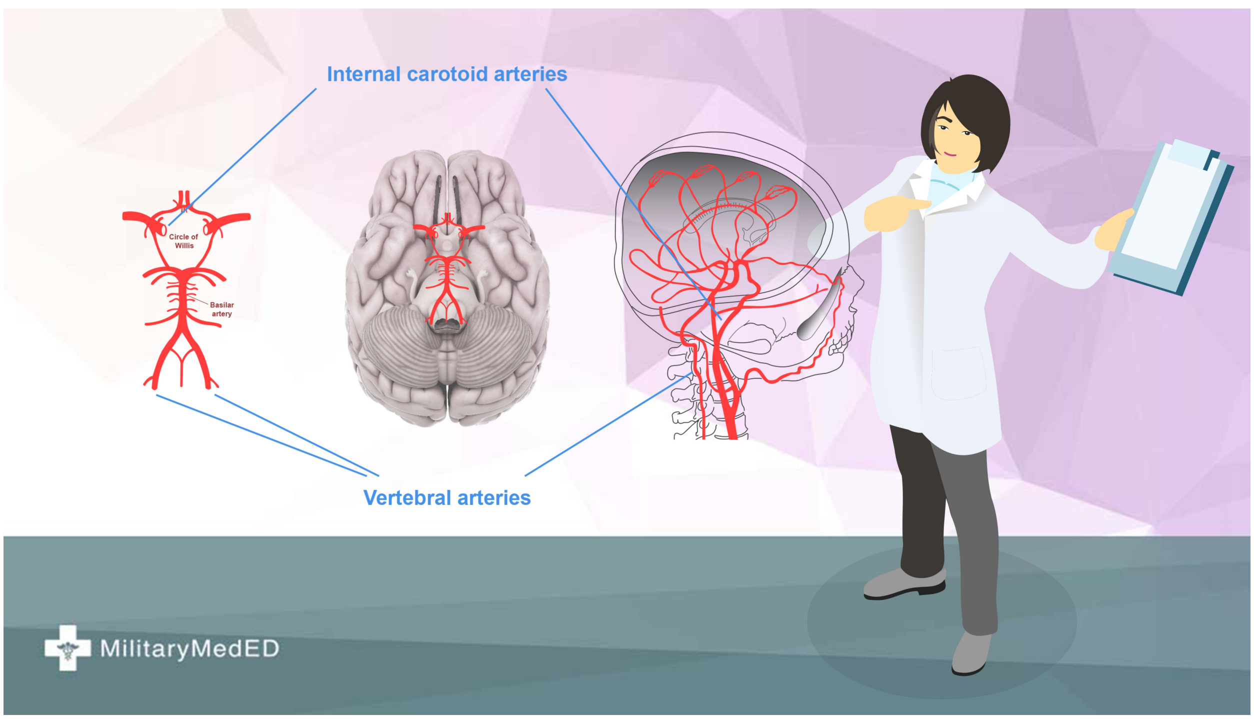
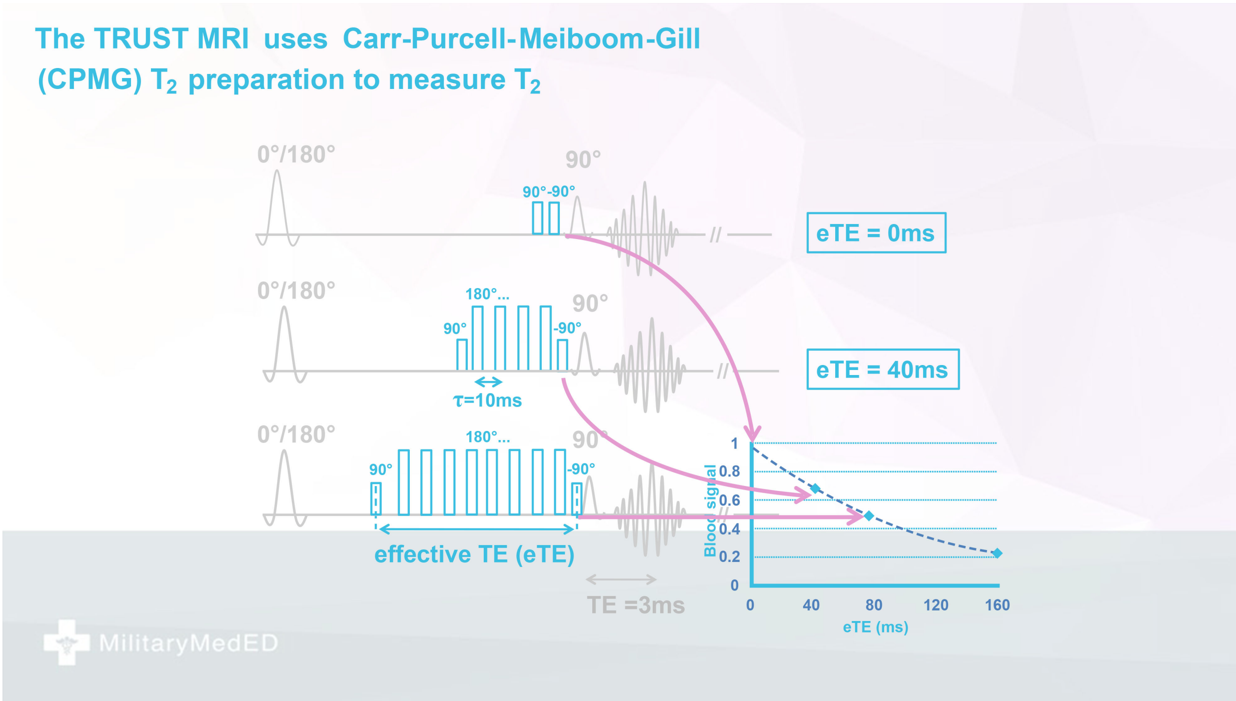
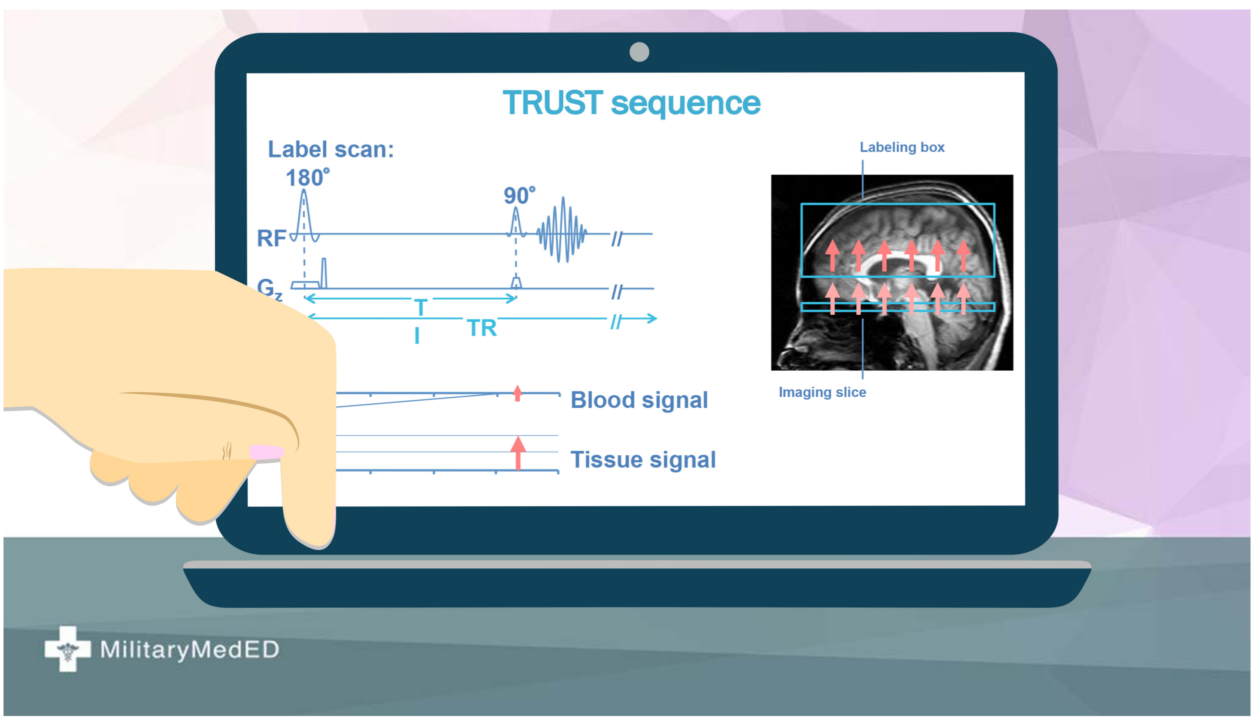

Measuring the
Cerebral Metabolic Rate
of Oxygen using MRI
Feng Xu
Department of Diagnostic Imaging & Radiology
Children's National Medical Center
MilitaryMedED


Internal carotoid arteries
Circle of Willis
Basilar artery
Vertebral arteries
MilitaryMedED


The TRUST MRI uses Carr-Purcell-Meiboom-Gill (CPMG) T_2 preparation to measure T_2
0°/180°
90°
90°-90°
eTE = 0ms
180°...
90°
-90°
τ=10ms
eTE = 40ms
effective TE (eTE)
TE =3ms
Blood signal
eTE (ms)
MilitaryMedED


TRUST sequence
Label scan:
180°
90°
RF
G_z
TI
TR
Labeling box
Imaging slice
Blood signal
Tissue signal
MilitaryMedED

Resting State fMRI
in Fetuses & Newborns

Josepheen De Asis-Cruz
Department of Diagnostic Imaging & Radiology
Children's National Medical Center

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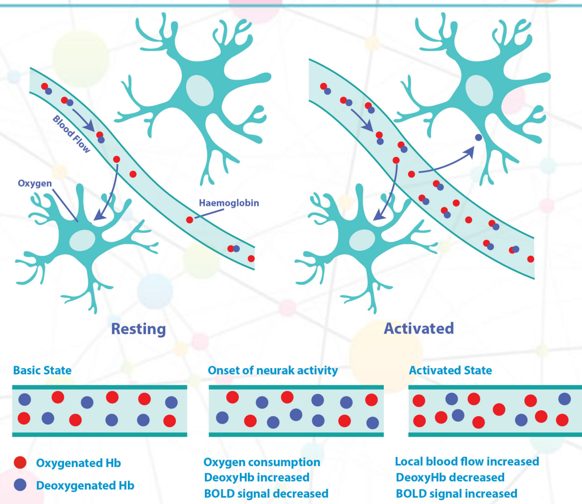
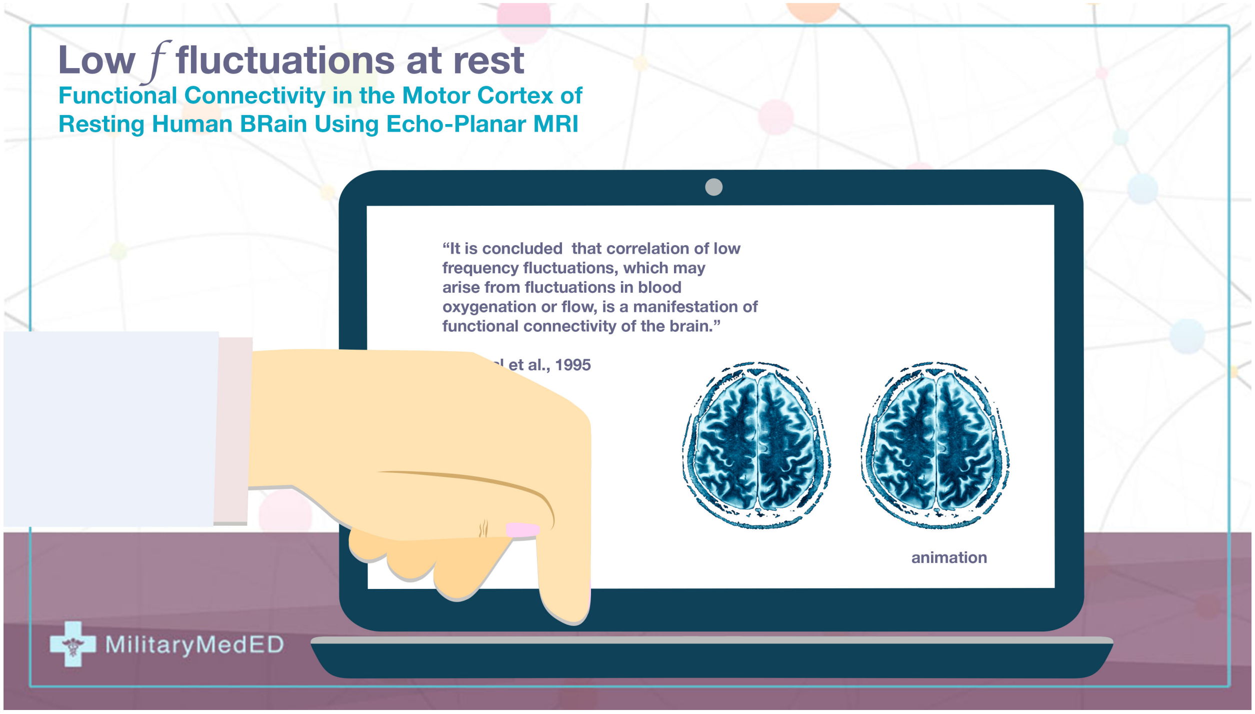
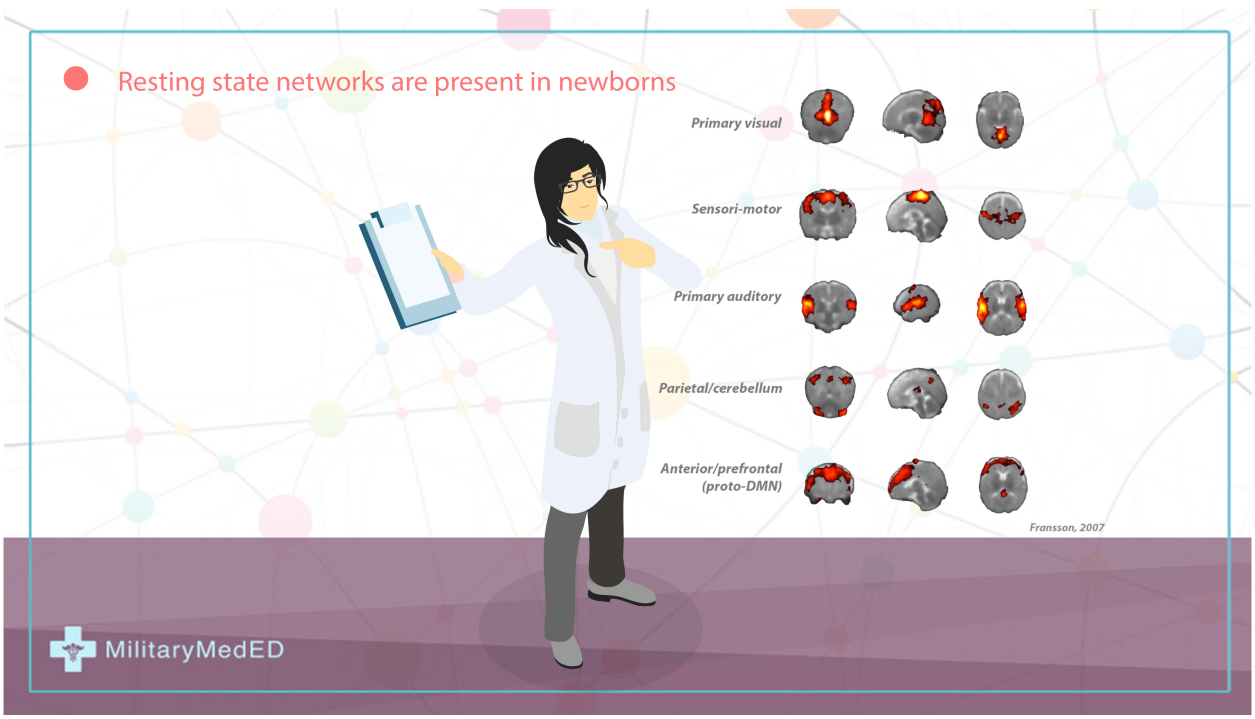
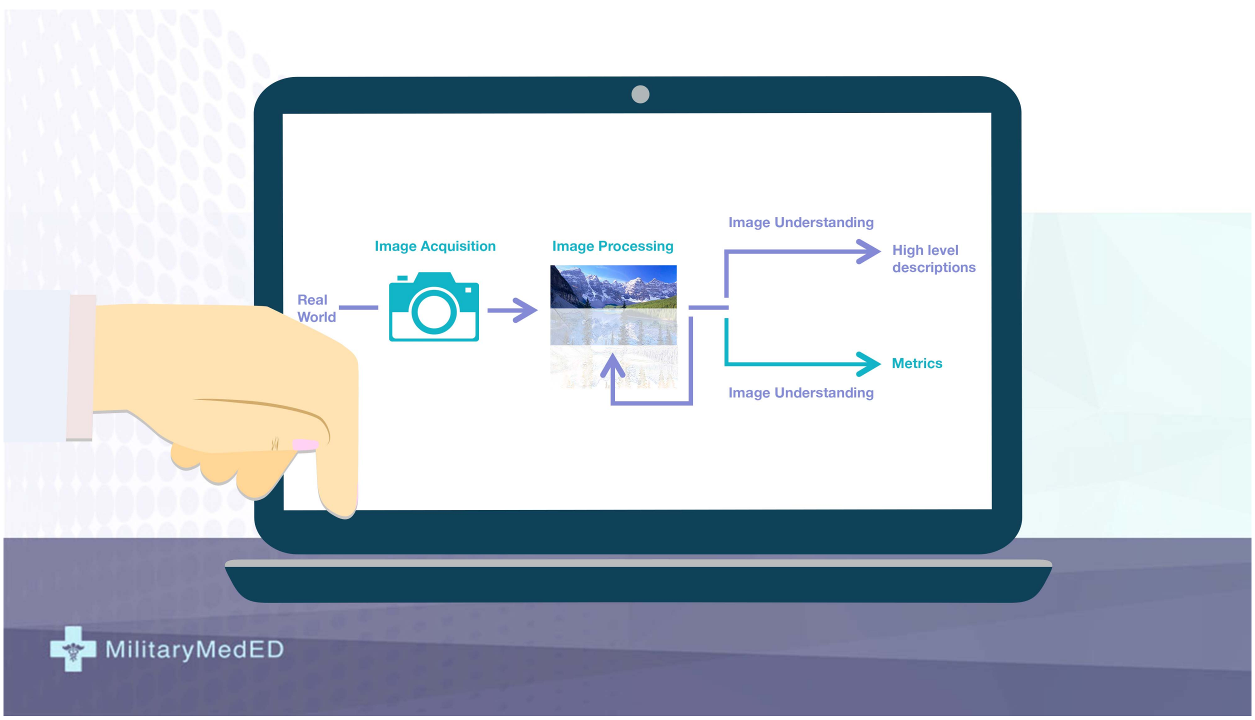


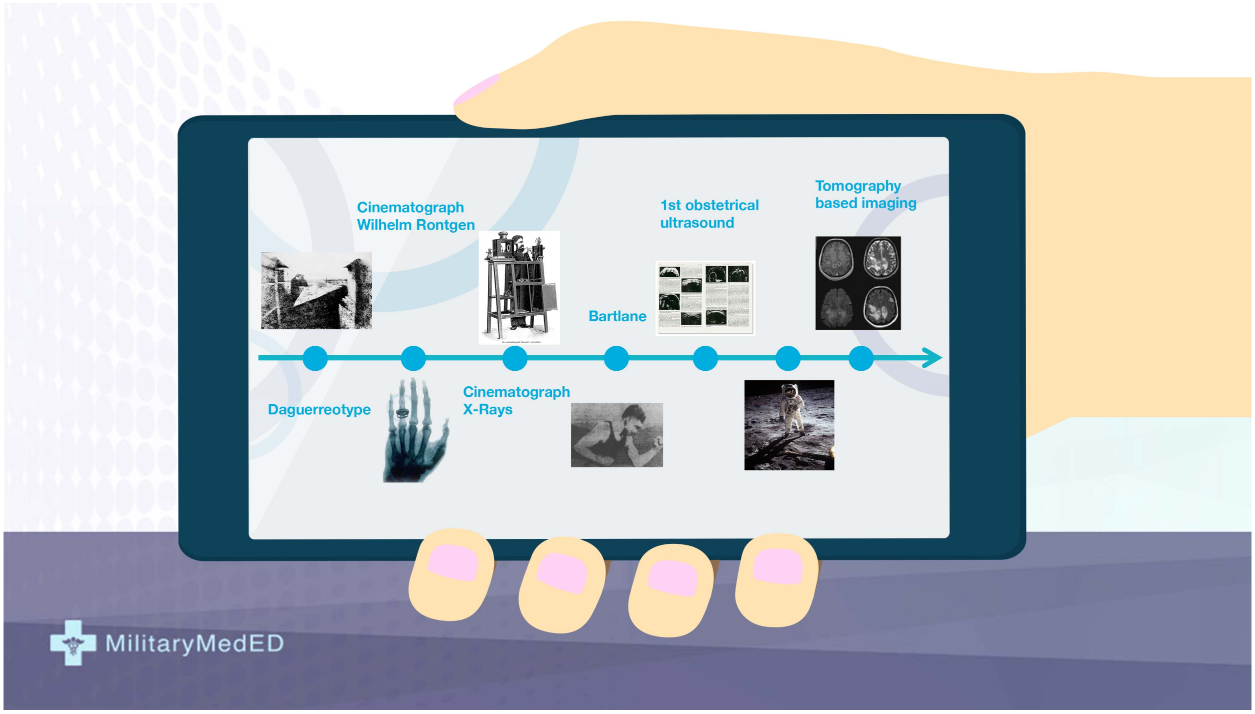
MilitaryMedED


Low f fluctuations at rest
Functional Connectivity in the Motor Cortex of Resting Human BRain Using Echo-Planar MRI
"It is concluded that correlation of low frequency fluctuations, which may arise from fluctuations in blood oxygenation or flow, is a manifestation of functional connectivity of the brain."
et al., 1995
animation
MilitaryMedED


Resting state networks are present in newborns
Primary visual
Sensori-motor
Primary auditory
Parietal/cerebellum
Anterior/prefrontal (proto-DMN)
Fransson, 2007
MilitaryMedED

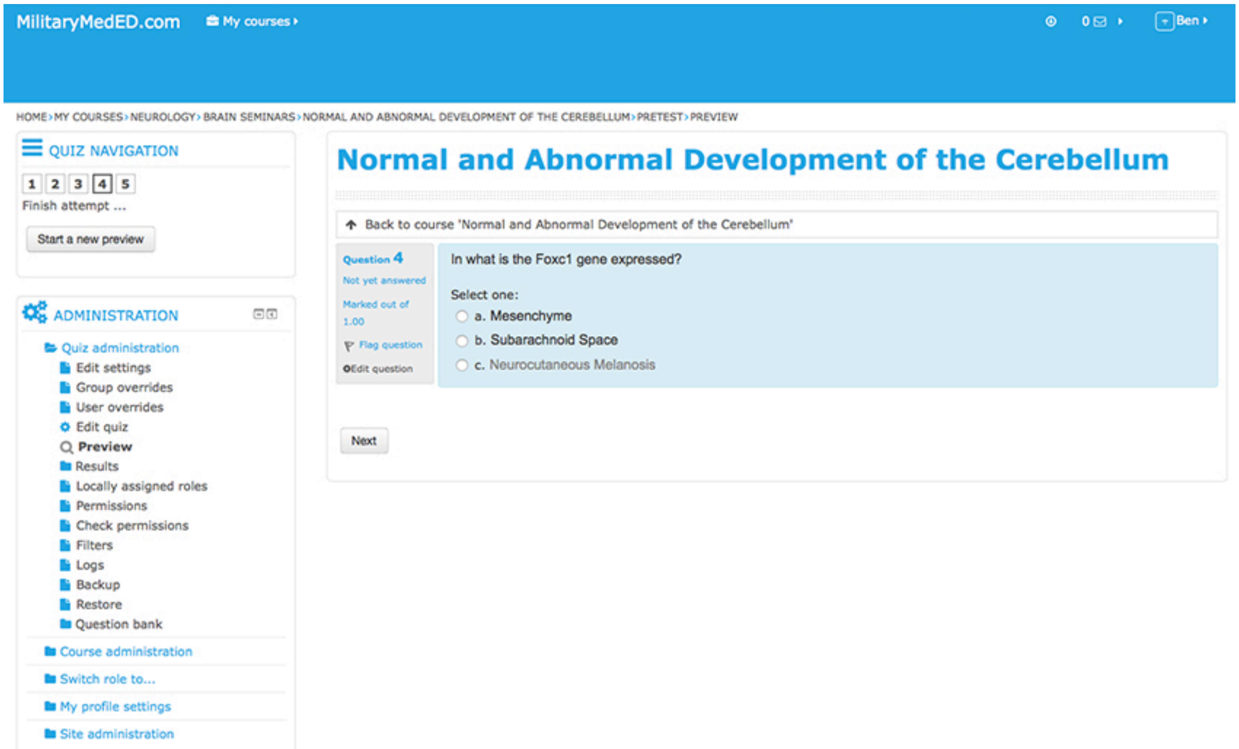

Introduction to
Image Processing
applications to medical imaging
Sonia Dahdouh
Department of Diagnostic Imaging & Radiology
Children's National Medical Center
MilitaryMedED

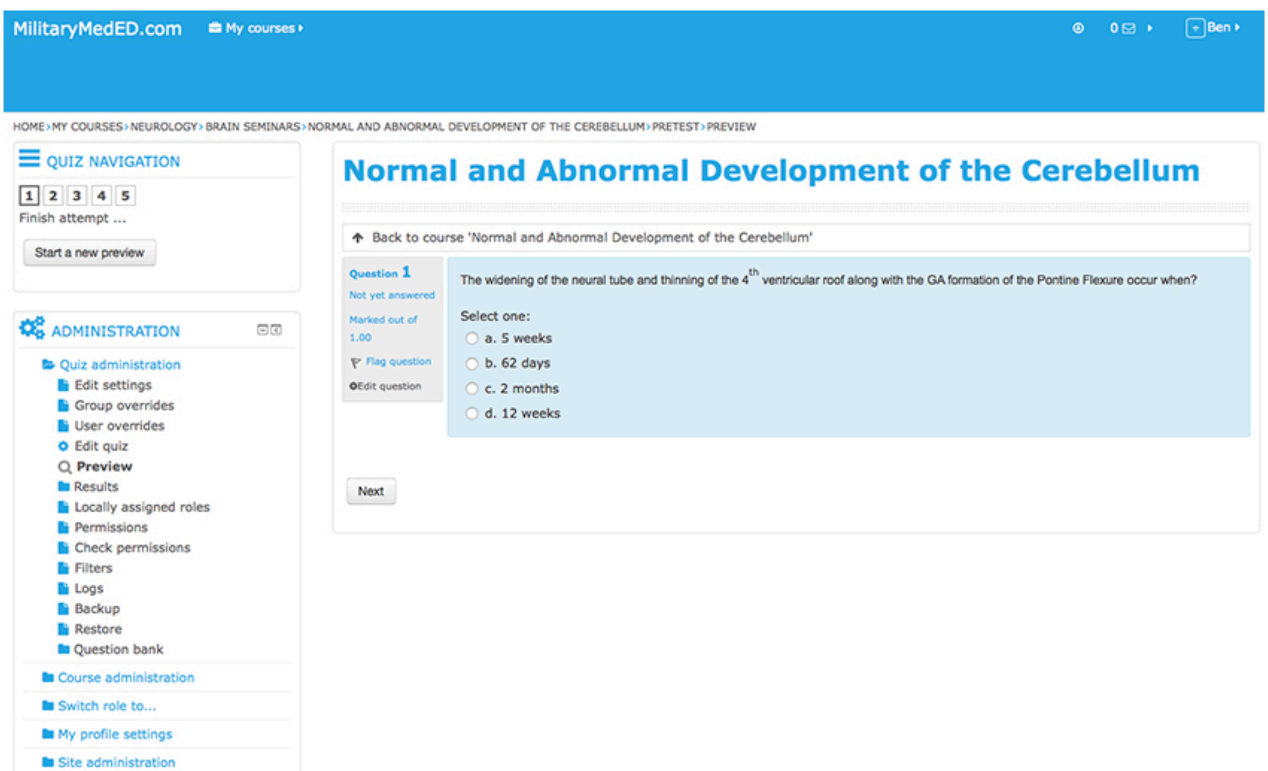

Real World
Image Acquisition
Image Processing
Image Understanding
High level descriptions
Metrics
Image Understanding
MilitaryMedED

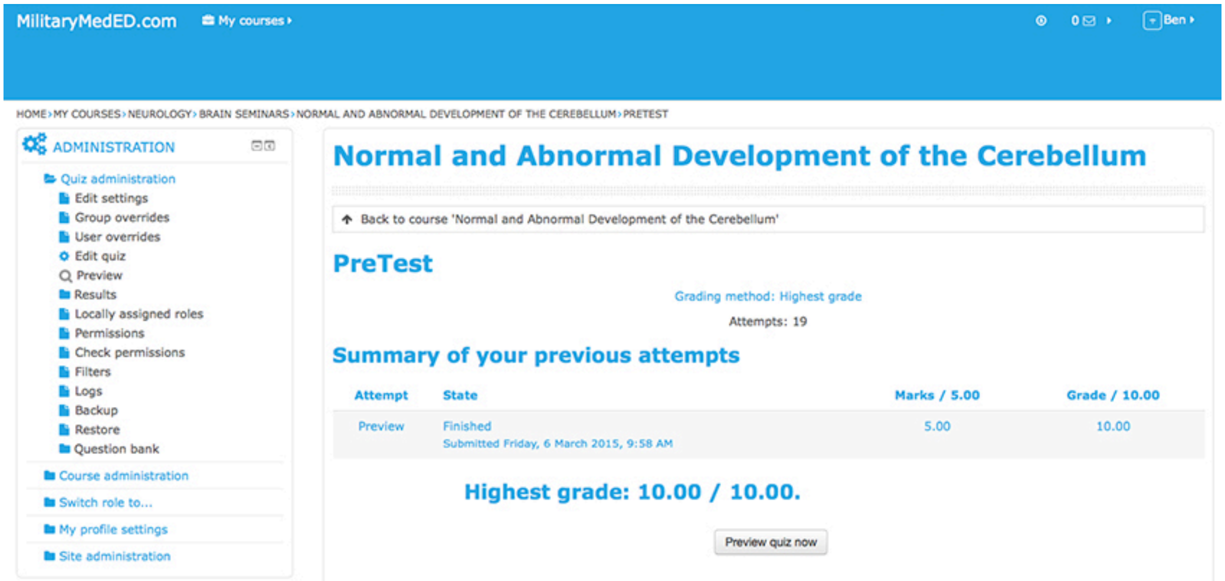

Cinematograph
Wilhelm Rontgen
1st obstetrical
ultrasound
Tomography
based imaging
Bartlane
Daguerreotype
Cinematograph
X-Rays
MilitaryMedED

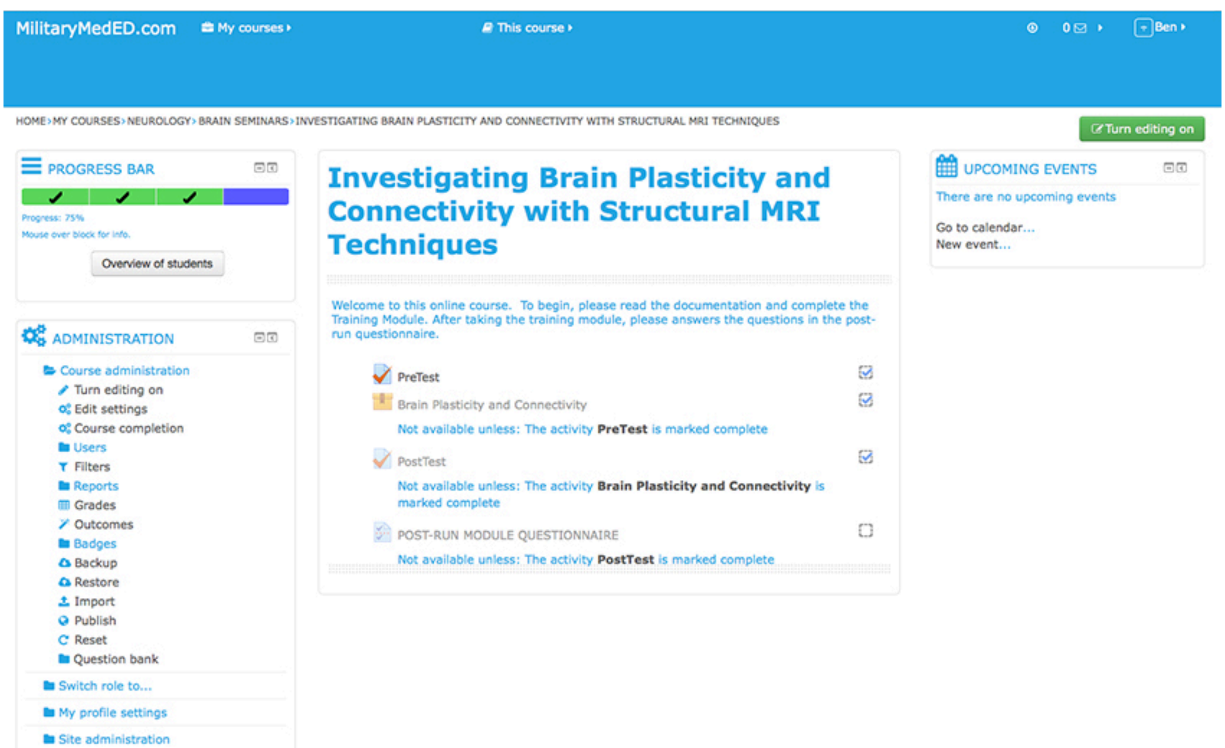

Wavelength (Meters)
10^{3} 10^{-2} 10^{-5} $0.5x10^{-6}$ 10^{-8} 10^{-10} 10^{-12}
Radio Microwave Infrared Visable Ultrviolet X-ray GammaRay
10^{4} 10^{8} 10^{12} 10^{15} 10^{16} 10^{18} 10^{20}
Frequency (Hz)
MilitaryMedED

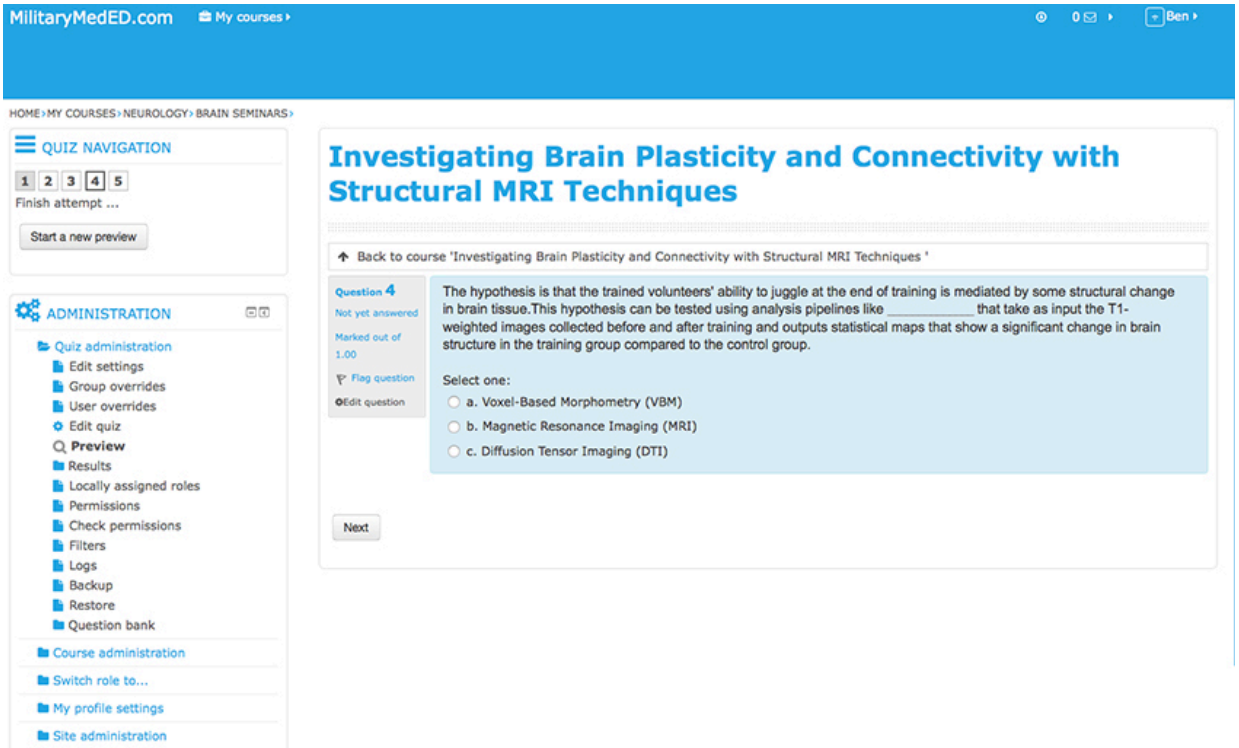
APPENDIX B
PRE AND POST KNOWLEDGE ASSESSMENT QUESTIONS

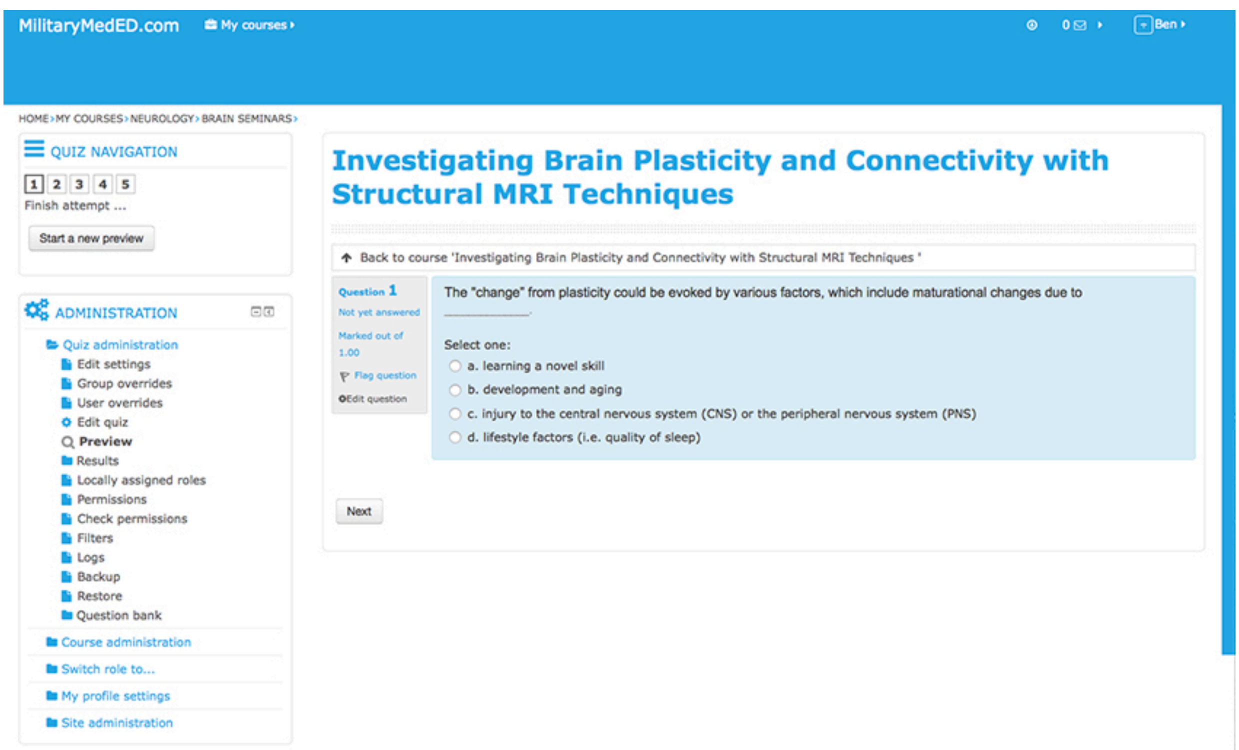





MilitaryMedED.com
My courses
Ben
HOME › MY COURSES › NEUROLOGY › BRAIN SEMINARS › NORMAL AND ABNORMAL DEVELOPMENT OF THE CEREBELLUM › PRETEST
ADMINISTRATION
Quiz administration
Edit settings
Group overrides
User overrides
Edit quiz
Preview
Results
Locally assigned roles
Permissions
Check permissions
Filters
Logs
Backup
Restore
Question bank
Course administration
Switch role to...
My profile settings
Site administration
Normal and Abnormal Development of the Cerebellum
Back to course 'Normal and Abnormal Development of the Cerebellum'
PreTest
Grading method: Highest grade
Attempts: 19
Summary of your previous attempts
Attempt
State
Marks / 5.00
Grade / 10.00
Preview
Finished
Submitted Friday, 6 March 2015, 9:58 AM
5.00
10.00
Highest grade: 10.00 / 10.00.
Preview quiz now


MilitaryMedED.com
My courses
This course
Ben
HOME › MY COURSES › NEUROLOGY › BRAIN SEMINARS › INVESTIGATING BRAIN PLASTICITY AND CONNECTIVITY WITH STRUCTURAL MRI TECHNIQUES
Turn editing on
PROGRESS BAR
Progress: 75%
Mouse over block for info.
Overview of students
ADMINISTRATION
Course administration
Turn editing on
Edit settings
Course completion
Users
Filters
Reports
Grades
Outcomes
Badges
Backup
Restore
Import
Publish
Reset
Question bank
Switch role to...
My profile settings
Site administration
Investigating Brain Plasticity and Connectivity with Structural MRI Techniques
Welcome to this online course. To begin, please read the documentation and complete the Training Module. After taking the training module, please answers the questions in the post-run questionnaire.
PreTest
Brain Plasticity and Connectivity
Not available unless: The activity PreTest is marked complete
PostTest
Not available unless: The activity Brain Plasticity and Connectivity is marked complete
POST-RUN MODULE QUESTIONNAIRE
Not available unless: The activity PostTest is marked complete
UPCOMING EVENTS
There are no upcoming events
Go to calendar...
New event...


MilitaryMedED.com
My courses
0
Ben
HOME › MY COURSES › NEUROLOGY › BRAIN SEMINARS ›
QUIZ NAVIGATION
1 2 3 4 5
Finish attempt ...
Start a new preview
ADMINISTRATION
Quiz administration
Edit settings
Group overrides
User overrides
Edit quiz
Preview
Results
Locally assigned roles
Permissions
Check permissions
Filters
Logs
Backup
Restore
Question bank
Course administration
Switch role to...
My profile settings
Site administration
Investigating Brain Plasticity and Connectivity with Structural MRI Techniques
Back to course 'Investigating Brain Plasticity and Connectivity with Structural MRI Techniques '
Question 4
Not yet answered
Marked out of 1.00
Flag question
Edit question
The hypothesis is that the trained volunteers' ability to juggle at the end of training is mediated by some structural change in brain tissue.This hypothesis can be tested using analysis pipelines like __________ that take as input the T1-weighted images collected before and after training and outputs statistical maps that show a significant change in brain structure in the training group compared to the control group.
Select one:
a. Voxel-Based Morphometry (VBM)
b. Magnetic Resonance Imaging (MRI)
c. Diffusion Tensor Imaging (DTI)
Next

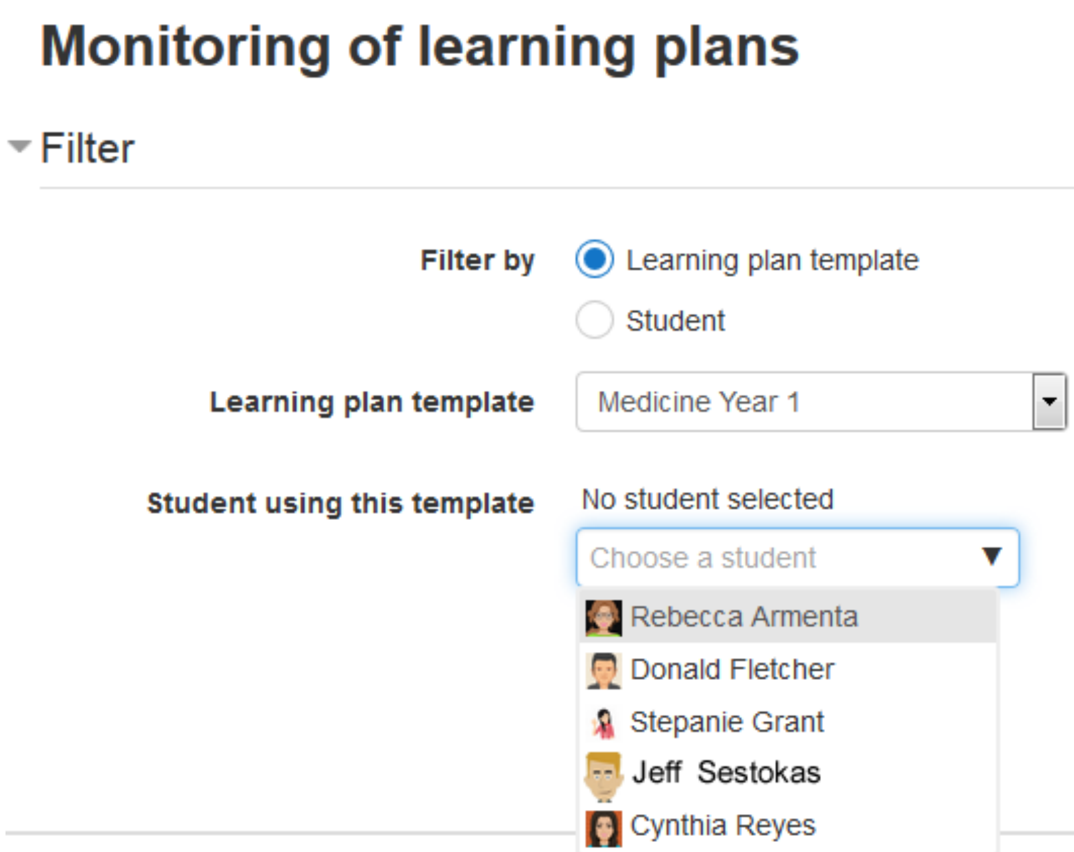

MilitaryMedED.com
My courses
0
Ben
HOME › MY COURSES › NEUROLOGY › BRAIN SEMINARS ›
QUIZ NAVIGATION
1 2 3 4 5
Finish attempt ...
Start a new preview
ADMINISTRATION
Quiz administration
Edit settings
Group overrides
User overrides
Edit quiz
Preview
Results
Locally assigned roles
Permissions
Check permissions
Filters
Logs
Backup
Restore
Question bank
Course administration
Switch role to...
My profile settings
Site administration
Investigating Brain Plasticity and Connectivity with Structural MRI Techniques
Back to course 'Investigating Brain Plasticity and Connectivity with Structural MRI Techniques '
Question 1
Not yet answered
Marked out of 1.00
Flag question
Edit question
The "change" from plasticity could be evoked by various factors, which include maturational changes due to __________.
Select one:
a. learning a novel skill
b. development and aging
c. injury to the central nervous system (CNS) or the peripheral nervous system (PNS)
d. lifestyle factors (i.e. quality of sleep)
Next

APPENDIX C
MAIN HIGHLIGHTS: NEW FEATURES & ENHANCEMENTS

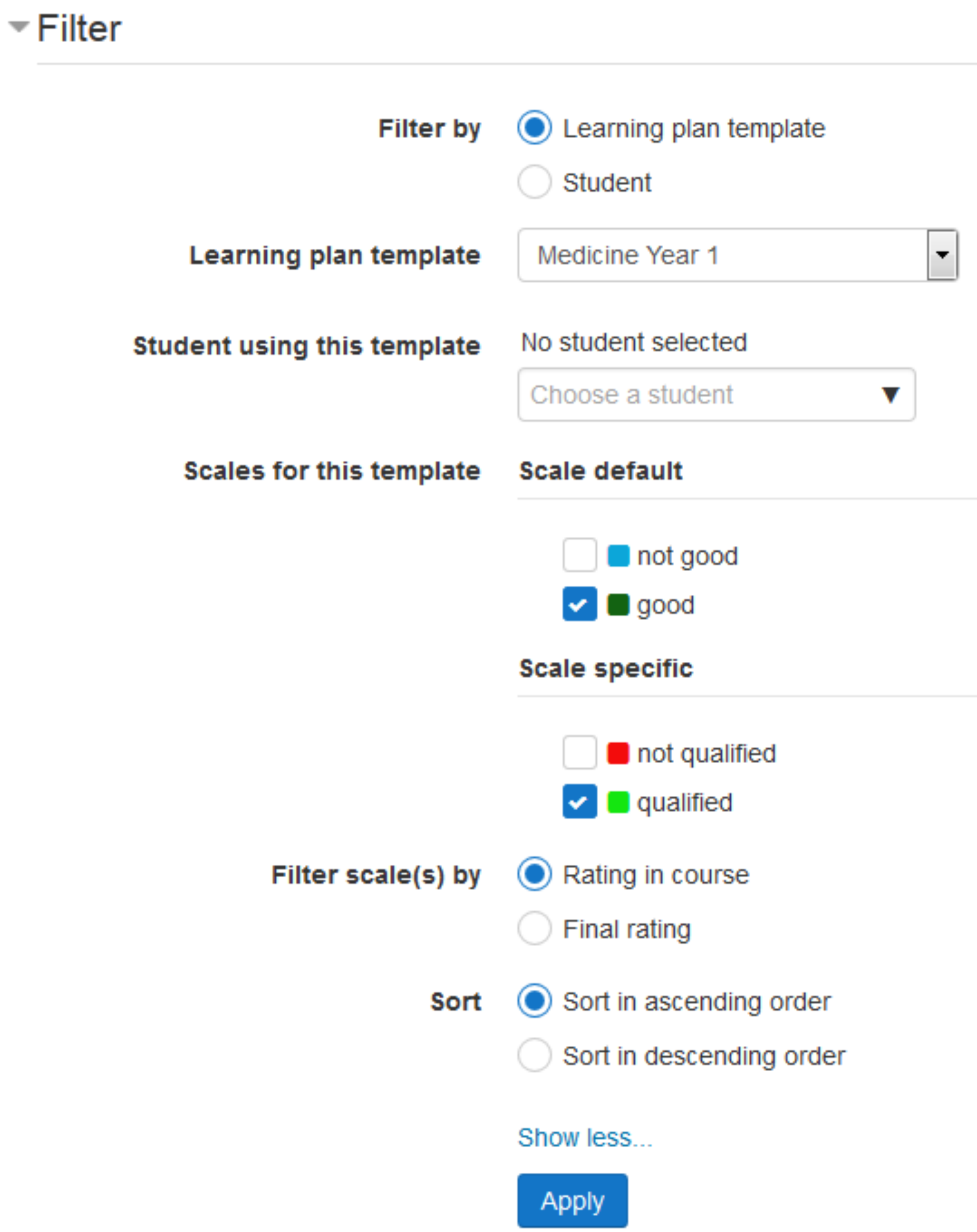
Sample Screenshots of New Features & UI/UX Enhancements for MilitaryMedEd.com

Filter by learning plan by custom template

In this filter you will see the learning plan of the student selected, and you can navigate between learning plan based on that template. If there is no student selected, the first student from the template will be displayed.



By clicking on "show more...", you can have more options to filter learning plans by scales values.

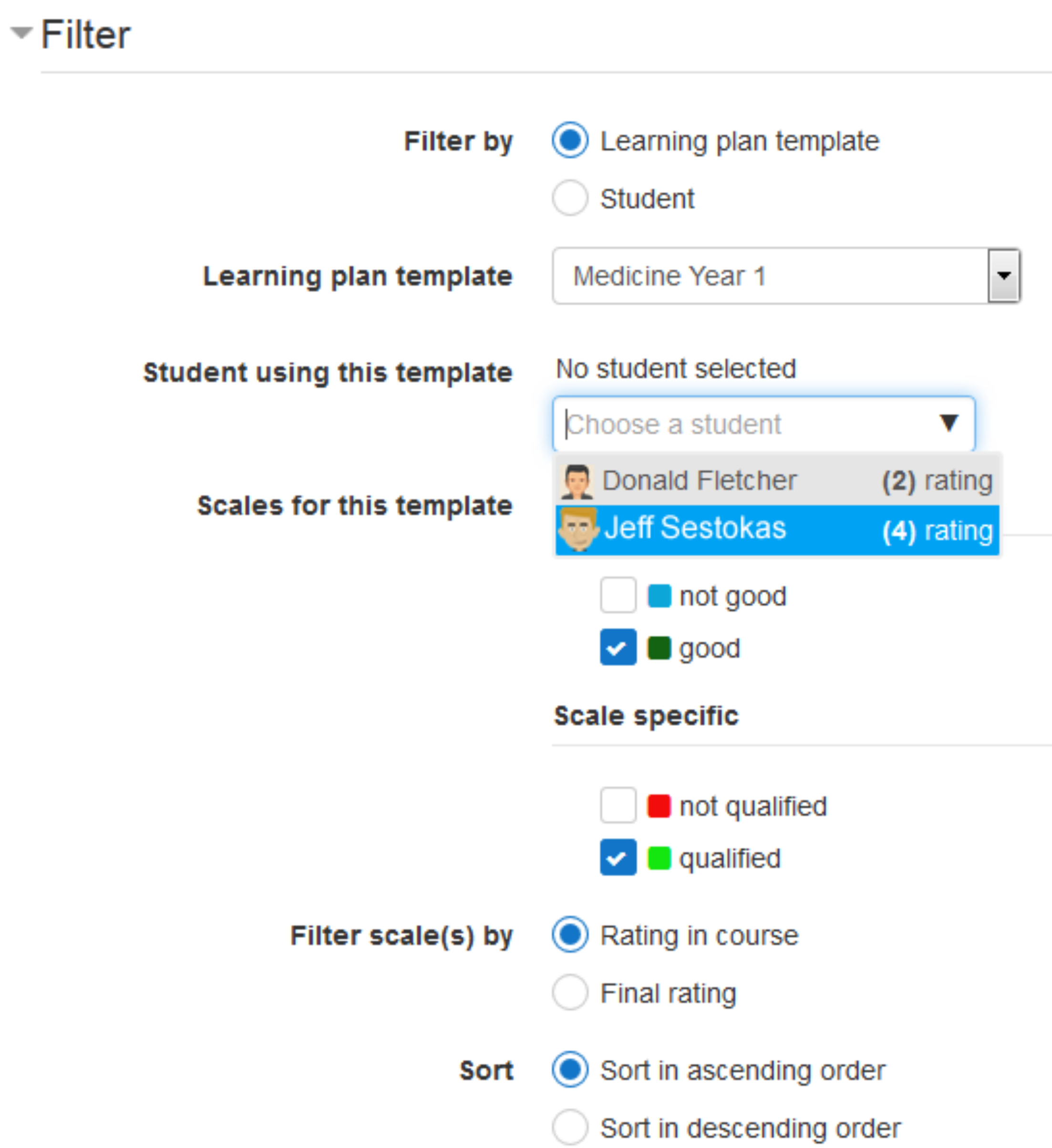


.

There are two options for using scales values filter

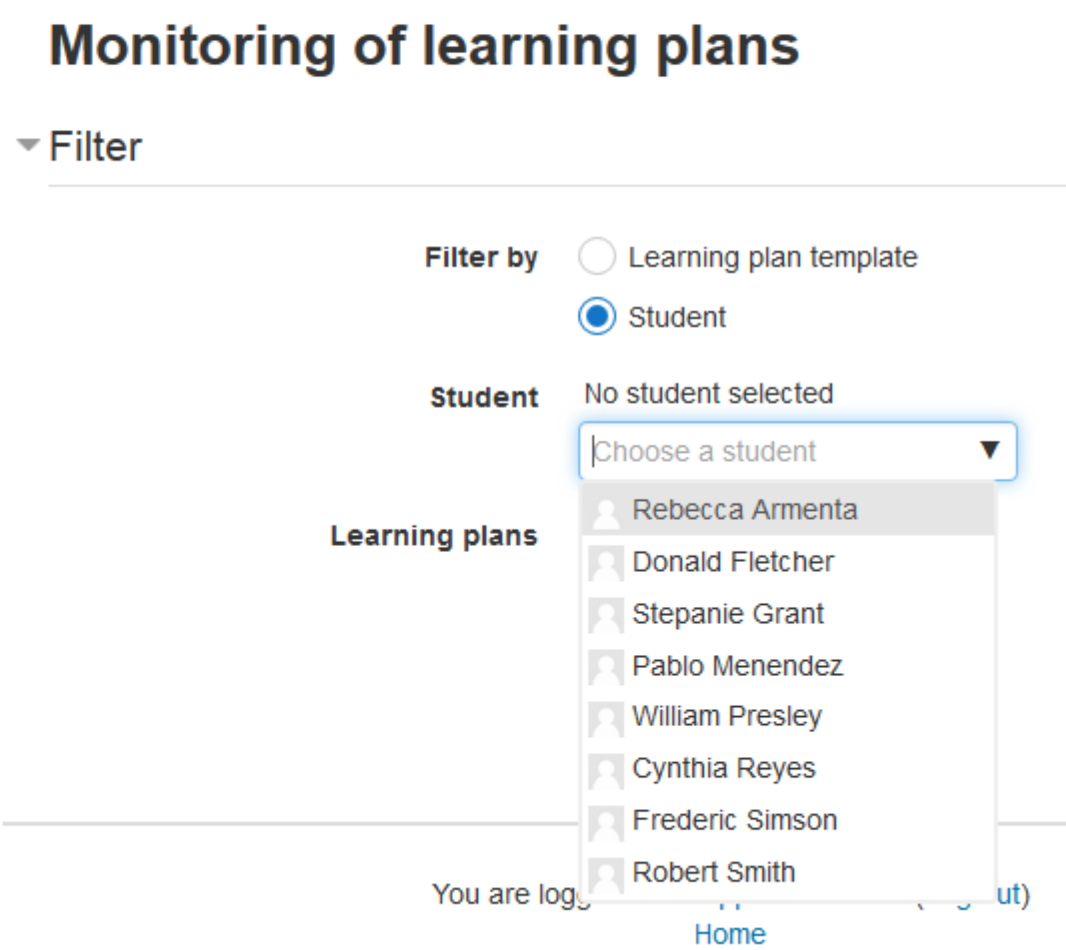
- Filtering learning plans by scale values from competencies rated at course level
- Filtering learning plans by scales values from competencies rated in the plan

When filtering by scales values, the number of rating in the student list will be displayed:

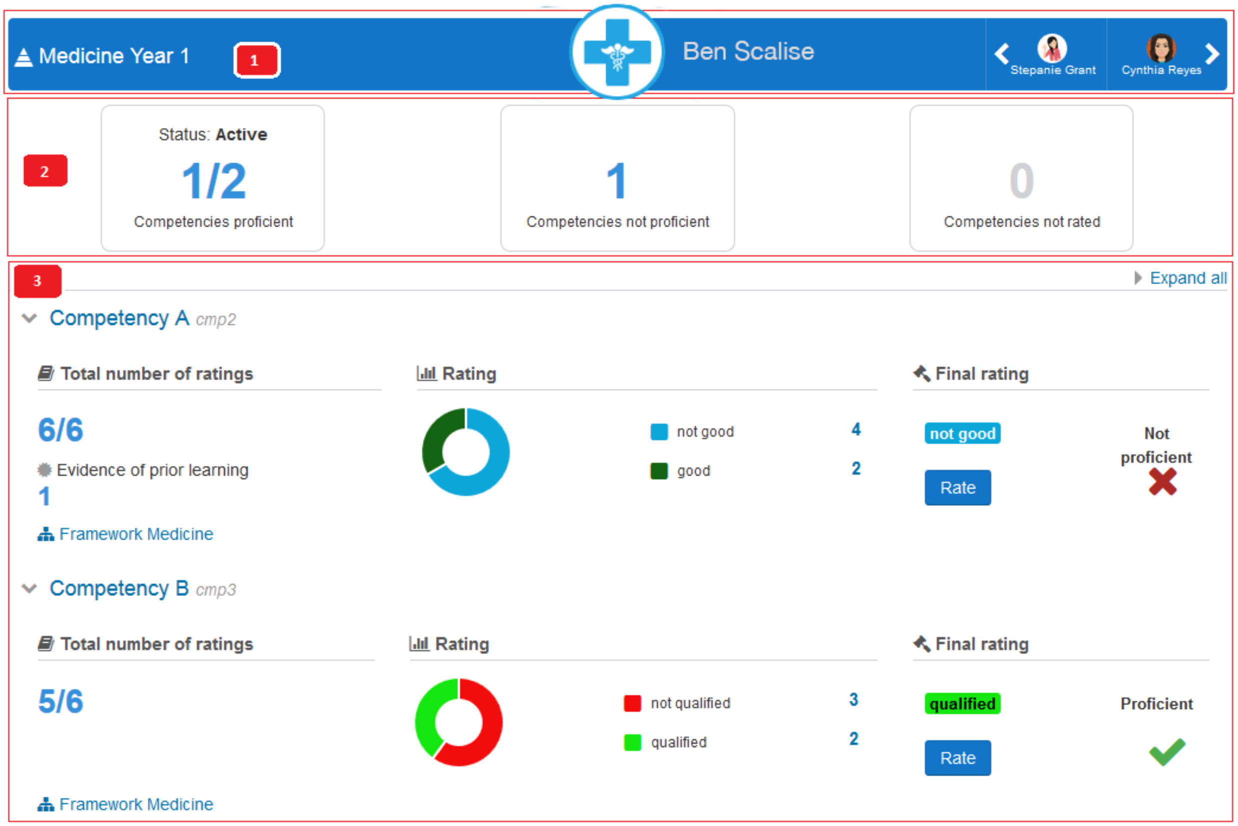


By User

We can choose a particular student by typing their name in the user picker field in order to retrieve their learning plans



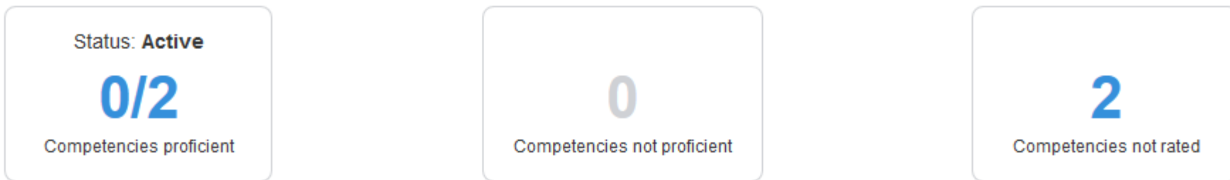
Learning plan detail
The details of the learning plan is divided into three blocks:



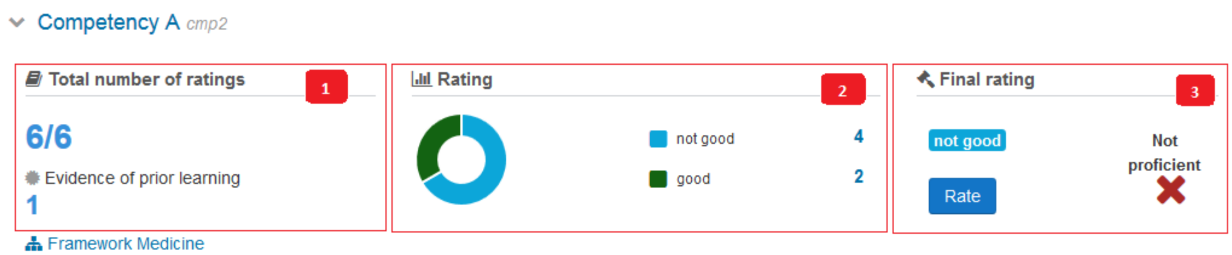
Learning plan competency information

This dashboard displays the following information:

- The plan's status and the number of competencies that are rated proficient on the total number of competencies of the plan
- The number competencies that are rated not proficient
- The number of competencies that are not rated

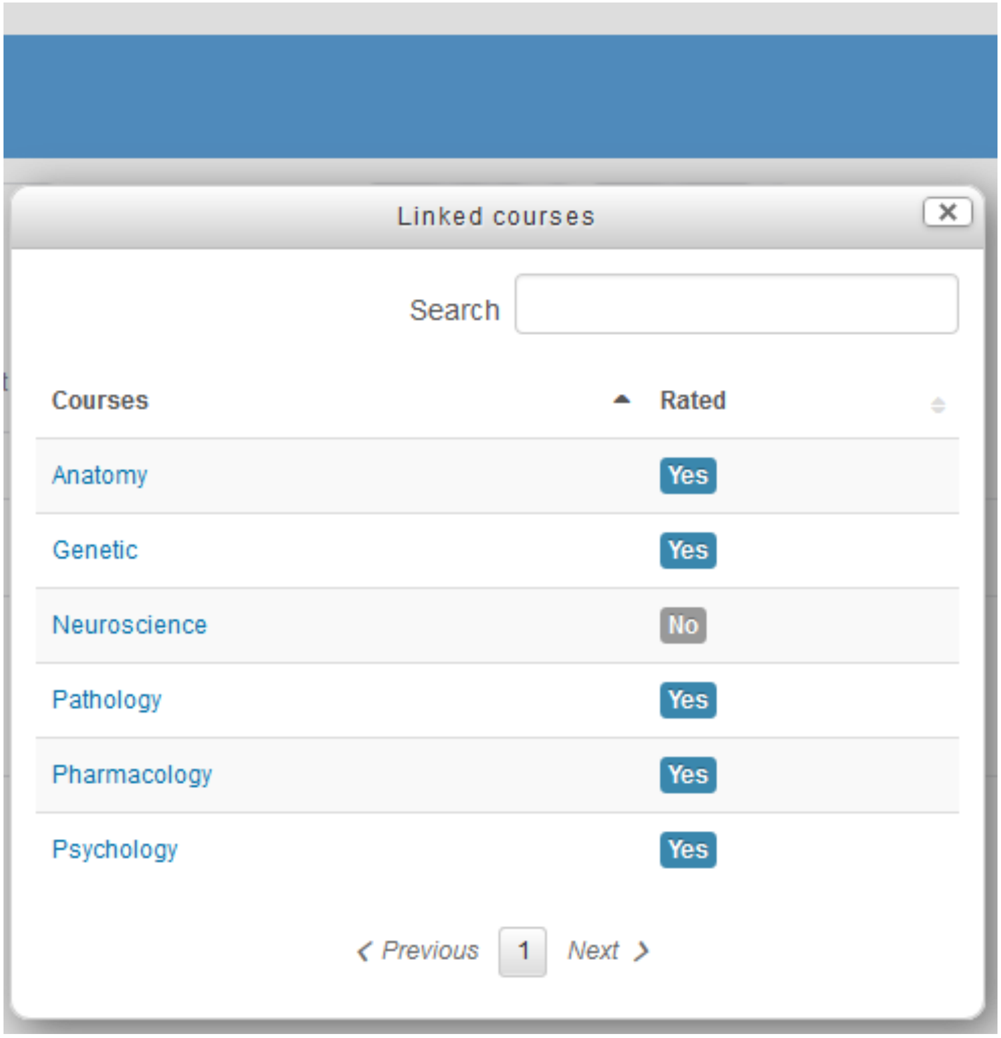


List competencies details
This part has three blocks

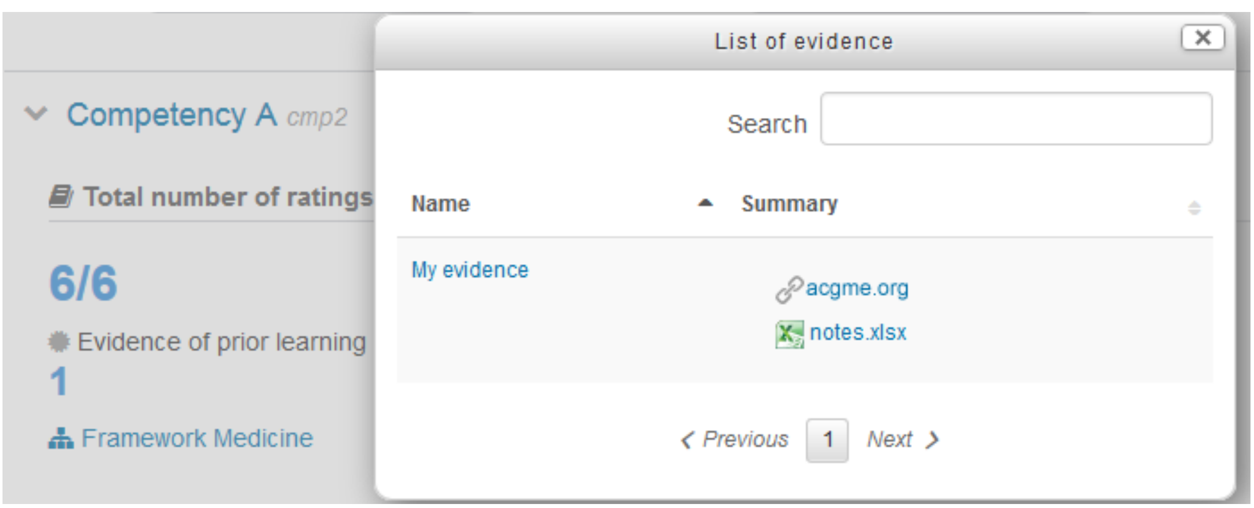


Total number of rating

It displays the number of courses linked to the competency and wherein the user is enrolled, Clicking on the number will trigger a popup containing the list of courses linked to the competency and if the course was rated or not.

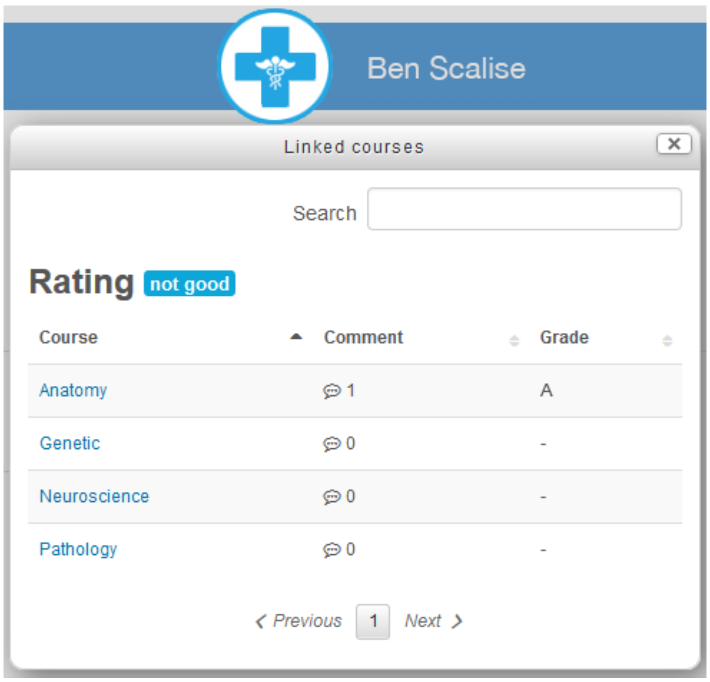


Additionally, this block displays the number of evidences of prior learning. You can have more details on the list of evidences by clicking on this number.



Rating

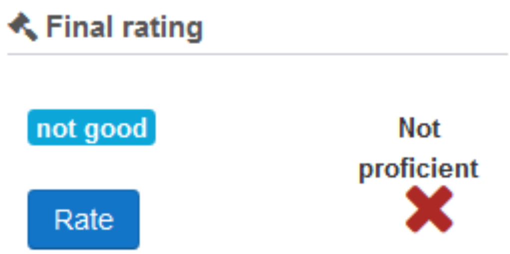
This block displays the number of rated courses by scale value. Clicking on this number triggers a window that displays the course name, comments left by the instructor and the final course grade.



Final rating

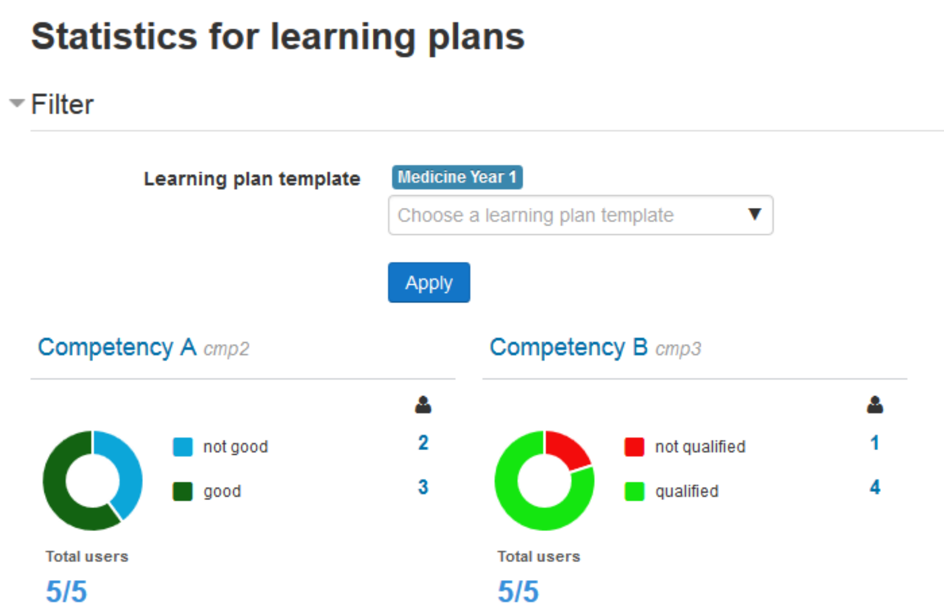
This block gives us details about the final rating (rating in learning plan):

- If the competency is proficient, not proficient or not rated
- The rated scale value (if rated)
- A button to rate the competency if the user has the permission



Statistics for learning plans

This page provides statistics for learning plans. It groups statistics by competency for a given template. For each competency we display the total users in a template and number of users by scale value

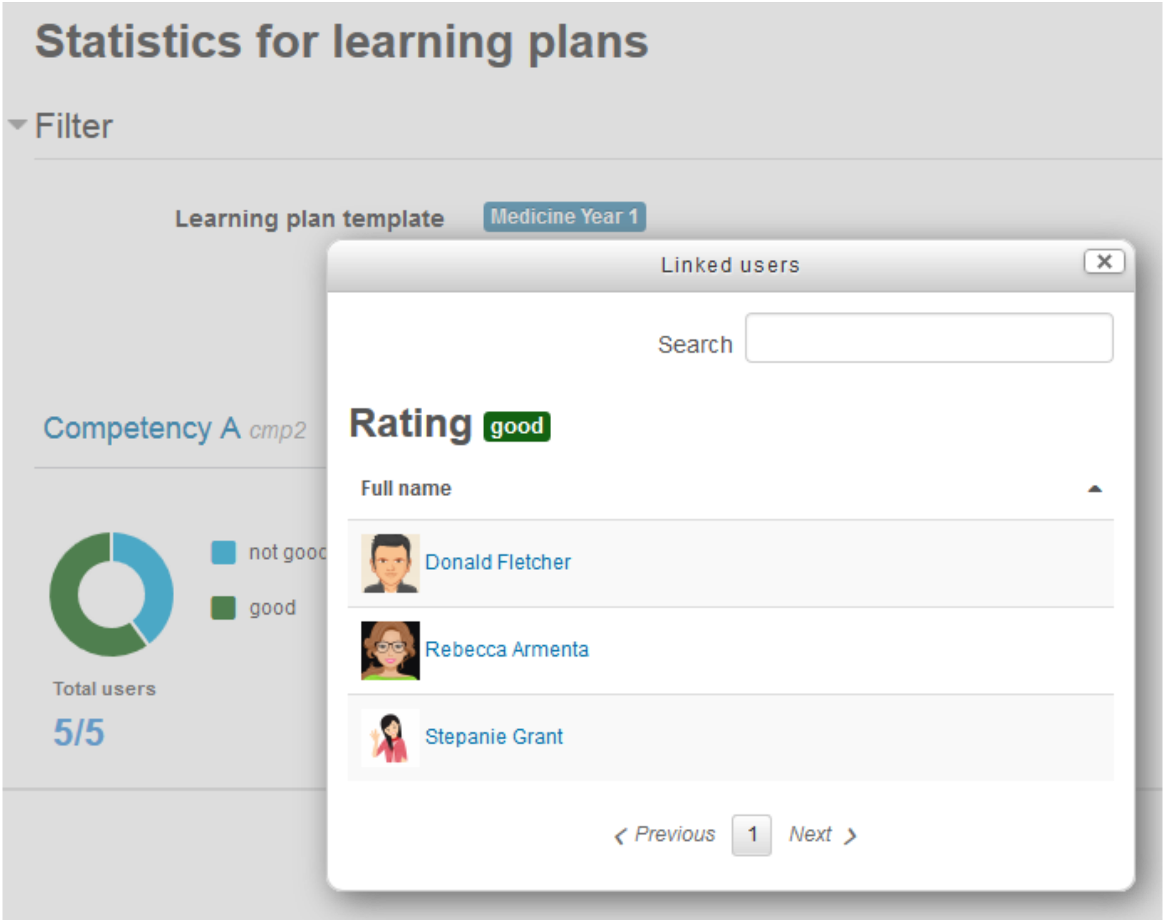


Total users

Clicking on the "Total users" number triggers a window with the list of all the users related to this competency. It shows whether each user has been rated or not.

Number of users by scale value

It displays the number of users rated with a given scale value for the competency.



<u>Monitoring of learning plans for users (students)</u>

This page gives the users the ability to keep track of their learning plans with all the details mentioned above. To access this page, instructors can visit the user profile page and click on “Monitoring of learning plans” in the reports block.

Reports

Monitoring of learning plans

Browser sessions

APPENDIX D
STORYBOARD PROCEDURE & TEMPLATE

I *Objectives*

- List 2-3 Objectives from presentation
- Remove any content from presentation not relevant to objectives
- View an example of a slide translated into a Storyboard [*see page4*]

II Narrative

- Condense & Bullet Point Main Dialog from Objectives
- Provide Script for Voice Over [*see page6*]

III *Assessment Questions*

- Create 3-5 assessment questions from Objectives [*see page5*]

Assessment Question Options:

a. **Create Assessment Questions throughout the body (preferred with or without Post-Test)**
b. Create Post-Test only
c. Create Post-Test with Assessment Questions throughout the body

***** This information can be delivered either via Storyboard Template as subsequently provided or in the Notes Section of your PowerPoint presentation slides.***

This will assist in creating the 3 main sections of the Module. See **link** for example. [http://www.childrensmedicaleducation.org/cbt/complex/mod1/story.html]

1. ***Intro***
    a. Home
    b. Welcome
    c. Learning Objectives Briefing

2. ***Body*** *(note that the Assessment Questions can be interspersed throughout the body as shown in this example and/or included as a Post Test at the end of the 2-3 Objectives)*
    a. Objective1
        i. Assessment Question
        ii. Assessment Question

    b. Objective2
        i. Assessment Question
    c. Objective3
        i. Assessment Question
        ii. Assessment Question

    d. Post Test *(Optional to include with or without interspersed Assessment Questions)*
        i. Assessment Questions
3. ***Summary***
    - Brief review of all content discussed

Online Learning Module Storyboard

Course:			
Module:			
Lesson:		1	
Segment:		1	
Page Title:		1	
Child Page:			
Objective:			

On-Screen Text:

Narration / Closed Captioning: Narrator

Graphics: (P – photo; G – graphic; F – flash animation; T – table/chart/graph; V – video)

Audio:

Knowledge Check: **Remedial Screen:** *Page ID*

Correct Feedback:	
1st try incorrect:	
2nd try incorrect:	

Explanatory Information:

Italics has no functional effect
Bold is a rollover
<u>Underscore</u> is a click to pop-up with click to close

Branching: Back: Next: